Vol. 1083 Number 3

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on October 16, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,476,587 through 4,477,926
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 2, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,395,784	06/318,579	8/2/83
4,395,787	06/253,355	8/2/83
4,395,788	06/420,815	8/2/83
4,395,798	06/261,975	8/2/83
4,395,805	06/259,176	8/2/83
4,395,821	06/292,863	8/2/83
4,395,823	06/284,982	8/2/83
4,395,826	06/238,145	8/2/83
4,395,834	06/320,103	8/2/83
4,395,837	06/218,699	8/2/83
4,395,844	06/307,346	8/2/83
4,395,845	06/271,391	8/2/83
4,395,867	06/265,420	8/2/83
4,395,880	06/242,453	8/2/83
4,395,881	06/234,741	8/2/83
4,395,888	06/312,744	8/2/83
4,395,895	06/305,350	8/2/83
4,395,898	06/237,675	8/2/83
4,395,901	06/291,227	8/2/83
4,395,908	06/296,769	8/2/83
4,395,920	06/224,804	8/2/83
4,395,932	06/345,598	8/2/83
4,395,934	06/356,880	8/2/83
4,395,935	06/283,139	8/2/83
4,395,939	06/230,823	8/2/83
4,395,940	06/262,636	8/2/83
4,395,942	06/311,423	8/2/83
4,395,951	06/230,577	8/2/83
4,395,957	06/258,885	8/2/83
4,395,962	06/304,741	8/2/83
4,395,966	06/288,643	8/2/83
4,395,969	06/303,341	8/2/83
4,395,977	06/229,119	8/2/83
4,395,982	06/266,170	8/2/83
4,395,997	06/322,388	8/2/83
4,396,000	06/284,223	8/2/83
4,396,006	06/310,787	8/2/83
4,396,009	06/233,129	8/2/83
4,396,014	06/233,918	8/2/83
4,396,021	06/216,374	8/2/83
4,396,027	06/360,178	8/2/83
4,396,029	06/234,485	8/2/83
4,396,032	06/252,617	8/2/83
4,396,035	06/270,840	8/2/83
4,396,038	06/337,533	8/2/83
4,396,044	06/315,486	8/2/83
4,396,045	06/251,677	8/2/83
4,396,054	06/230,340	8/2/83
4,396,055	06/226,319	8/2/83
4,396,060	06/282,159	8/2/83
4,396,075	06/276,551	8/2/83
4,396,090	06/361,042	8/2/83
4,396,094	06/260,103	8/2/83
4,396,105	06/306,427	8/2/83
4,396,106	06/307,293	8/2/83
4,396,116	06/270,108	8/2/83
4,396,119	06/297,235	8/2/83
4,396,123	06/255,794	8/2/83
4,396,127	06/281,857	8/2/83
4,396,131	06/243,501	8/2/83
4,396,150	06/318,123	8/2/83
4,396,155	06/297,624	8/2/83
4,396,161	06/247,408	8/2/83
4,396,163	06/281,833	8/2/83
4,396,165	06/304,189	8/2/83
4,396,166	06/278,643	8/2/83
4,396,168	06/237,771	8/2/83
4,396,169	06/238,628	8/2/83
4,396,171	06/324,899	8/2/83
4,396,174	06/352,800	8/2/83
4,396,176	06/233,917	8/2/83
4,396,196	06/412,588	8/2/83
4,396,201	06/308,974	8/2/83
4,396,208	06/252,367	8/2/83
4,396,215	06/295,344	8/2/83
4,396,217	06/258,469	8/2/83
4,396,219	06/330,239	8/2/83
4,396,223	06/241,368	8/2/83
4,396,230	06/276,552	8/2/83
4,396,231	06/227,588	8/2/83
4,396,234	06/251,271	8/2/83
4,396,237	06/240,555	8/2/83
4,396,238	06/232,336	8/2/83
4,396,259	06/313,235	8/2/83
4,396,273	06/286,046	8/2/83

Patent Number	Serial Number	Issue Date
4,396,291	06/354,341	8/2/83
4,396,298	06/289,786	8/2/83
4,396,300	06/259,466	8/2/83
4,396,305	06/227,333	8/2/83
4,396,331	06/324,841	8/2/83
4,396,332	06/274,063	8/2/83
4,396,333	06/266,838	8/2/83
4,396,346	06/263,014	8/2/83
4,396,353	06/253,424	8/2/83
4,396,356	06/256,843	8/2/83
4,396,399	06/278,816	8/2/83
4,396,400	06/254,048	8/2/83
4,396,401	06/288,126	8/2/83
4,396,409	06/329,816	8/2/83
4,396,412	06/265,275	8/2/83
4,396,416	06/252,982	8/2/83
4,396,422	06/356,073	8/2/83
4,396,434	06/320,301	8/2/83
4,396,435	06/349,341	8/2/83
4,396,436	06/284,731	8/2/83
4,396,442	06/263,903	8/2/83
4,396,451	06/329,353	8/2/83
4,396,456	06/332,559	8/2/83
4,396,459	06/418,886	8/2/83
4,396,463	06/242,260	8/2/83
4,396,481	06/247,824	8/2/83
4,396,491	06/386,795	8/2/83
4,396,503	06/291,882	8/2/83
4,396,504	06/347,117	8/2/83
4,396,506	06/297,060	8/2/83
4,396,508	06/296,961	8/2/83
4,396,510	06/223,390	8/2/83
4,396,532	06/324,957	8/2/83
4,396,533	06/343,248	8/2/83
4,396,557	06/260,766	8/2/83
4,396,559	06/396,558	8/2/83
4,396,568	06/284,492	8/2/83
4,396,570	06/259,402	8/2/83
4,396,571	06/329,507	8/2/83
4,396,584	06/268,757	8/2/83
4,396,587	06/294,027	8/2/83
4,396,591	06/379,363	8/2/83
4,396,600	06/217,575	8/2/83
4,396,602	06/304,467	8/2/83
4,396,610	06/219,537	8/2/83
4,396,612	06/290,933	8/2/83
4,396,626	06/306,534	8/2/83
4,396,628	06/352,599	8/2/83
4,396,629	06/220,412	8/2/83
4,396,649	06/323,376	8/2/83
4,396,661	06/338,852	8/2/83
4,396,675	06/421,150	8/2/83
4,396,726	06/339,237	8/2/83
4,396,765	06/363,268	8/2/83
4,396,767	06/244,490	8/2/83
4,396,777	06/362,733	8/2/83
4,396,782	06/337,898	8/2/83
4,396,785	06/290,931	8/2/83
4,396,786	06/270,814	8/2/83
4,396,787	06/324,331	8/2/83
4,396,795	06/279,188	8/2/83
4,396,802	06/267,937	8/2/83
4,396,810	06/274,016	8/2/83
4,396,811	06/328,835	8/2/83
4,396,815	06/281,408	8/2/83
4,396,820	06/285,133	8/2/83
4,396,831	06/230,361	8/2/83
4,396,836	06/271,878	8/2/83
4,396,837	06/232,365	8/2/83
4,396,842	06/310,110	8/2/83
4,396,843	06/280,080	8/2/83
4,396,846	06/328,217	8/2/83
4,396,893	06/269,153	8/2/83
4,396,899	06/248,179	8/2/83
4,396,911	06/248,075	8/2/83
4,396,922	06/229,237	8/2/83
4,397,022	06/230,136	8/2/83
4,397,035	06/290,478	8/2/83
4,397,037	06/294,131	8/2/83
4,397,0[illegible]	06/241,455	8/2/83

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,518,132, Re. S.N. 093,786, Filed Sept. 4, 1987, Cl. 242/107.4A, COMBINATION SEAT BELT RETRACTOR MECHANISM, Timothy J. Schmidt, Owner of Record: *General Safety Corp., St. Clair Shores, Mich.,* Attorney or Agent: Luis M. Acosta, et al., Ex. Gp.: 245

4,540,504, Re. S.N. 094,640, Filed Sept. 9, 1987, Cl. 252/99, DENTURE CLEANER HAVING IMPROVED DISSOLUTION TIME AND CLARITY AND METHOD OF PREPARATION, Anthony B. J. Eoga, Owner of Record: *Warner-Lambert Co., Morris Plain, N.J.,* Attorney or Agent: Elizabeth Anderson, et al., Ex. Gp.: 115

4,550,246, Re. S.N. 090,697, Filed Aug. 28, 1987, Cl. 235/385, INVENTORY CONTROL AND REPORTING SYSTEM FOR DRYCLEANING STORES, Herbert L. Markman, Owner of Record: *Inventor,* Attorney or Agent: J. Rodman Steele, Jr., et al., Ex. Gp.: 233

4,615,150, Re. S.N. 089,012, Filed Aug. 21, 1987, Cl. 51/178, DEVICE FOR THE IN SITU REPROFILING OF THE HEAD OF AT LEAST ONE RAIL OF A RAILROAD TRACK, Romolo Panetti, Owner of Record: *Speno International S.A., Geneva, Switzerland,* Attorney or Agent: Robert J. Patch, Ex. Gp.: 323

4,646,686, Re. S.N. 094,401, Filed Sept. 4, 1987, Cl. 119/51R, SELECTIVE BIRD FEEDER, Walter Furlani, Owner of Record: *Inventor,* Attorney or Agent: Joseph L. Spiegel, Ex. Gp.: 333

4,667,637, Re. S.N. 094,721, Filed Sept. 9, 1987, Cl. 123/435, GATED KNOCK DETECTOR FOR INTERNAL-COMBUSTION ENGINES, Richard E. Staerzl, Owner of Record: *Brunswick Corp., Stokie, Ill.,* Attorney or Agent: Roy C. Hopgood, et al., Ex. Gp.: 342

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,028,844, Reexam. No. 90/001,329, Requested: Sept. 14, 1987, Cl. 446/97, TOY BUILDING BLOCK FOR SUPPLEMENTING EXISTING BLOCK SETS, Erling Dideriksen, Owner of Record: *Interlego A.G., Baar, Switzerland,* Attorney or Agent: Unknown, Ex. Gp.: 330, Requester: Owner

4,184,046, Reexam. No. 90/001,330, Requested: Sept. 15, 1987, Cl. 381/16, COMPATIBLE SINGER SIDEBAND SYSTEM FOR AM STEREO, Norman W. Parker, Owner of Record: *Motorola, Inc., Schaumburg, Ill.,* Attorney or Agent: James W. Gillman, Ex. Gp.: 260, Requester: Leonard R. Kahn, New York, N.Y.

4,214,403, Reexam. No. 90/001,328, Requested: Sept. 14, 1987, Cl. 46/25, HINGE ELEMENT, Jens Knud-

sen, Owner of Record: *Interlego A.G., Baar, Switzerland,* Attorney or Agent: Unknown, Ex. Gp.: 330, Requester: Owner

4,264,751, Reexam. No. 90/001,332, Requested: Sept. 17, 1987, Cl. 525/437, COPOLYESTER RESIN HAVING MINIMAL CARBOXYL TERMINATED ENDS AND METHOD FOR PRODUCING THE SAME, Anthony S. Scheibelhoffer, Owner of Record: *The Goodyear Tire & Rubber Co., Akron, Ohio,* Attorney or Agent: Alvin S. Rockhill, Ex. Gp.: 150, Requester: Owner

4,323,071, Reexam. No. 90/001,327, Requested: Sept. 10, 1987, Cl. 128/343, VASCULAR GUIDING CATHETER ASSEMBLY AND VASCULAR DILATING CATHETER ASSEMBLY AND A COMBINATION THEREOF AND METHOD OF MAKING THE SAME, John B. Simpson, et al., Owner of Record: *Advanced Cardiovascular Systems, Inc., Mountain View, Calif.,* Attorney or Agent: Edward J. Lynch, Ex. Gp.: 330, Requester: Owner

4,645,171, Reexam. No. 90/001,331, Requested: Sept. 18, 1987, Cl. 248/637, HONEYCOMB TABLETOP, Ulf Heide, Owner of Record: *Technical Mftg. Corp., Peabody, Mass.,* Attorney or Agent: Richard L. Stevens, Ex. Gp.: 350, Requester: Owner

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Errata

"All reference to Patent No. 4,675,913 to Theodore H. Rockwell, Steamboat Plaza Co., for 'KNUCKLE SAVER GLOVE', appearing in the Official Gazette of June 30, 1987, should be deleted since no patent was granted".

"All reference to Patent No. 4,695,461 to Sebastian M. Laurent, et al., of La., for 'BONE DISORDER TREATMENT', appearing in the Official Gazette of Sept. 22, 1987, should be deleted since no patent was granted".

Patent and Trademark Office
Board of Patent Appeals and Interferences Vacancies

The Board of Patent Appeals and Interferences will be filling a number of Examiner-in-Chief vacancies over the next several months. Positions are available in chemical, electrical, and mechanical technologies. Persons interested in being considered for these vacancies are invited to submit individual applications for each of the following vacancy announcements:

PTO–87–A6–chemical technology, PTO–87–A7–electrical technology, and PTO–87–A8–mechanical technology. There is no deadline for submitting applications. However, candidates are urged to apply as soon as possible since applications will be accepted only until the positions are filled.

Excerpts from the vacancy announcements describing the duties of the position, qualification requirements, factors to be used in evaluating candidates, and necessary application materials are listed below.

Duties: Serves as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office. As an Examiner-in-Chief, participates in the Board's appellate and administrative responsibilities and exercises independent judgment on all matters before him/her on appeal, subject to administrative and policy direction of the Commissioner, and may be responsible for conducting interlocutory proceedings in interference and for determining questions of priority of invention and patentability between interference parties. Appeals filed in accordance with 35 USC 134 and interferences declared in accordance with 35 USC 135 involve complex legal and technical questions. The Board of Patent Appeals and Interferences has the sole power to:

(1) hear and adjudicate appeals from decisions of the Primary Examiners as to patentability in applications for patents, for reissue of patents, and for reexamination of patents;
(2) to declare and to conduct proceedings in interferences; and
(3) to determine priority of invention.

Final decisions of the Board, if unfavorable to an applicant, or to a party to an interference, may be appealed to the United States Court of Appeals for the Federal Circuit or civil action may be taken in accordance with 35 USC 145, or 35 USC 146.

Qualification requirements: In addition to a technical degree, candidates must possess:

(1) A minimum of five years of comprehensive patent experience of which at least two years involved the exercise of independent judgment in a responsible position as typified by the exercise of Full Signatory Authority as a Patent Examiner or by comparable experience in some other position inside or outside the Patent and Trademark Office;
(2) A law degree and membership in good standing of the bar in any state, D.C., Puerto Rico, or any territorial court under the Constitution;
(3) A high degree of demonstrated competence in chemical, electrical, or mechanical technology;
(4) A high degree of demonstrated competence and knowledge of interference law and practice;
(5) Demonstrated ability to determine whether or not tests which are submitted in evidence are technically sufficient to prove the question at hand;
(6) Demonstrated ability to write clearly, and to write logically developed opinions;
(7) Demonstrated ability to use legal and technical background to evaluate testimony of witnesses;
(8) Demonstrated ability to deal effectively with people within and outside the Patent and Trademark Office; and
(9) Comprehensive experience in patent prosecution, examination, or administration which demonstrates a thorough knowledge and application of patent laws and rules of practice.

Factors which will be considered in evaluating qualified candidates: Candidates will be evaluated on the total range of their education, training and experience as well as supervisory appraisals and questionnaire responses.

Interested candidates should submit the following:

(1) Personal Qualifications Statement, SF–171;
(2) Merit Program Interest Statement, CD–261 (PTO employees only);
(3) Current supervisory appraisal on your agency's form or on CD–362 (letters of reference for outside candidates);
(4) Annual narrative performance rating, or equivalent;
(5) Examiner-in-Chief Questionnaires; and
(6) Samples which evidence your writing ability.

Questions concerning this notice and requests for application materials should be directed to Ms. Suzanne Waddill, Office of Personnel, One Crystal Park, Suite 700, Arlington, Va., telephone (703) 557–3631.

DONALD W. PETERSON,
Deputy Assistant Secretary and Deputy Commissioner or Patents and Trademarks.

Feb. 3, 1987.

Notice of Examination for Registration Wed., Apr. 13, 1988

Pursuant to the provisions of 37 C.F.R. §§10.5, 10.6 and 10.7, an examination for persons seeking registration before the United States Patent and Trademark Office as patent attorneys and agents will be held on *Wed., Apr. 13, 1988*. the deadline for filing applications along with the $250 fee and all necessary showings required by 37 CFR §§10.7(a) and (b) is *Jan. 31, 1988*.

With the exception of those persons who actively served four years or more in the examining corps of the Patent and Trademark Office for whom the examination is waived, all persons recognized for practice before the Patent and Trademark Office in patent cases must, pursuant to the noted rules, pass the examination. Note: those passing the examination do not qualify for recognition for practice before the Patent and Trademark Office in trademark cases. Recognition for practice in trademark cases is governed by 37 C.F.R. §10.14, which does not require the passing of an examination.

Any candidate who has failed to pass the examination after *three* opportunities and who desires to retake the examination a fourth time must submit with his or her application an affidavit giving a list of the studies pursued by him or her since the last examination, and the time occupied with them together with a certificate by the person under whose direction he or she has studied, showing that the candidate has so studied during a period of at least one year.

Any candidate who has failed to pass the examination after *four* opportunities and who desires to retake the examination for a fifth time must submit an affidavit with his or her application giving a list of studies pursued by him or her since the last examination, and the time occupied with them together with a certificate by the person under whose direction he or she has studied, showing that the candidate has so studied during a period of at least one year. The showing for admission to the fifth examination must be different from and more extensive than that for the fourth examination and must establish to the satisfaction of the Director of Enrollment and Discipline that the studies pursued by the candidate will more likely result in the candidate passing the examination.

Any candidate who has failed to pass the examination after *five* opportunities and who desires to retake the examination again will not be permitted to retake the examination unless admission to the examination is granted by the Director of Enrollment and Discipline upon written request by the candidate establishing extraordinary circumstances which would justify the candidate's admission.

Any officer or employee of the United States government who passes the examination, but whose official duties *do not* require the preparation and prosecution of applications for patent, will be endorsed as inactive on the register of attorneys and agents. (18 U.S.C. §§203 and 205).

Under 37 CFR §10.7(b), persons seeking registration must submit "satisfactory proof of good moral character and repute and of sufficient basic training in scientific and technical matters. . . ." The initial submissions of many persons not having degrees in physics, chemistry and engineering are usually inadequate, and often must be supplemented before such persons are approved to take an examination. To afford adequate time to present a satisfactory supplemental showing, it is recommended that persons file their applications early, preferably *at least two months* before the Jan. 31, 1988 deadline. Supplemental showings of qualifickations and applications received after Jan. 31, 1988 will be considered only in connection with admission to the next succeeding examination.

The examination will be given under the supervision of the Office of Personnel Management and may be taken at specific locations in which the Office of Personnel Management conducts this examination.

Application blanks may be obtained from the Office of Enrollment and Discipline, Suite 810, Crystal Park 1, 2011 Crystal Dr., Arlington, Va. or by mail addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231, and directed to the attention of the Office of Enrollment and Discipline.

CAMERON WEIFFENBACH,
Director, Office of Enrollment and Discipline.

Sept. 16, 1987.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Another Dimension, Inc., Brooklyn Park, Minn., Reg. No. 1,194,374, for the mark "ANOTHER DIMENSION AND DESIGN", Canc. No. 16,321.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Ulrich E. Spoerri, dba Artel Art & Electronics, Santa Fe, N. Mex., Reg. No. 1,300,273, for the mark "ARTEL", Canc. No. 16,433.

ERMA S. BROWN,
Administrator of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 20, 1987

D. 290,532	4,633,886	4,659,628	4,669,197
4,312,804	4,634,168	4,659,679	4,669,311
4,401,369	4,634,605	4,659,913	4,669,424
4,504,910	4,636,150	4,659,969	4,670,275
4,530,891	4,636,495	4,660,282	4,670,497
4,532,514	4,637,852	4,661,530	4,670,579
4,566,484	4,638,781	4,662,319	4,671,054
4,570,523	4,640,719	4,662,355	4,671,338
4,573,688	4,641,240	4,662,879	4,671,435
4,574,192	4,643,829	4,663,021	4,671,677
4,578,909	4,644,510	4,663,022	4,672,943
4,583,583	4,644,551	4,663,117	4,673,120
4,583,686	4,644,999	4,663,131	4,673,477
4,589,755	4,645,164	4,663,310	4,673,543
4,591,093	4,645,678	4,663,332	4,673,744
4,593,357	4,646,281	4,663,472	4,673,802
4,594,440	4,647,343	4,663,520	4,674,013
4,596,603	4,649,085	4,663,832	4,674,398
4,599,889	4,650,557	4,664,013	4,674,845
4,602,344	4,650,613	4,664,248	4,674,899
4,605,638	4,650,742	4,664,434	4,674,904
4,615,995	4,650,790	4,664,938	4,674,943
4,617,459	4,652,610	4,665,604	4,675,693
4,620,443	4,652,842	4,665,950	4,675,899
4,621,044	4,653,158	4,666,419	4,676,203
4,621,100	4,655,182	4,666,449	4,676,739
4,627,826	4,655,259	4,666,472	4,676,970
4,627,947	4,656,175	4,666,747	4,677,823
4,629,792	4,656,241	4,667,104	4,678,863
4,630,314	4,656,283	4,667,111	4,679,701
4,630,401	4,656,338	4,667,866	4,680,091
4,631,483	4,657,623	4,667,888	4,680,786
4,632,091	4,658,476	4,667,986	4,683,403
4,632,203	4,658,920	4,668,412	
4,633,762	4,659,265	4,668,596	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext. 21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4222
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 12, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-13-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-30-86
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-30-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	12-27-84
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	11-4-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-22-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-30-85
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	3-25-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-28-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-01-86

Expiration of patents: The patents within the range of numbers indicated below expire during September 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,526,004 to 3,531,805, inclusive

Plant Patents ..... Numbers 2,989 to 2,990 inclusive

REEXAMINATIONS

OCTOBER 20, 1987

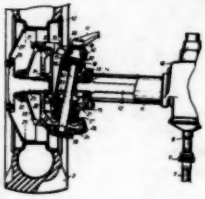
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,980,151 (771st)

FRONT WHEEL DRIVE ASSEMBLY FOR FOUR-WHEEL DRIVE TRACTOR

Yoshinobu Murayama; Kenzou Sada, and Mitsuhiro Kutomi, all of Sakai, Japan, assignors to Kubota Tekko Kabushiki Kaisha, Osaka, Japan

Reexamination Request No. 90/001,134, Dec. 3, 1986.
Reexamination Certificate for Patent No. 3,980,151, issued Sep. 14, 1976, Ser. No. 572,900, Apr. 29, 1975.
Claims priority, application Japan, Aug. 13, 1974, 49-93132
Int. Cl.[4] B60K *17/30*
U.S. Cl. 180—261



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

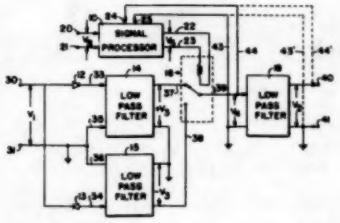
1. A front wheel drive assembly for use in a four-wheel drive tractor comprising a front wheel axle housing *(11)* rotatably supporting a differential yoke shaft *(12)* having a *first* bevel pinion *(13)* at its outer end, a first gear case *(16)* fixedly mounted on the outer end of the front wheel axle *housing* and having a pin portion *(19)* projecting from a cap of the case, an upright bevel pinion shaft *(22)* housed in and rotatably supported by the *first* case *(16)* and having a *second* bevel pinion *(23)* meshing with the *first* bevel pinion *(13)*, bevel pinion shaft *(22)* having [another] *first* bevel gear *(24)* below the *second* bevel pinion *(23)* thereon, *a second gear case, said second gear case including a main body having a central aperture therein and a cover having an upper, intermediate and bottom portion, said second gear case supporting* a front wheel hub shaft *(25)* fixed *at an outer end thereof* to [the] *a* disk of the front wheel and [having] a terminal reduction *second bevel gear (28) secured on its inner end,* [and a] *said main body of said second gear* case *(29)* [housing the bevel gear on the hub shaft and] *rotatably supporting said hub shaft near its outer end in said aperture and together with said cover (32)* rotatably supporting [the] *said* hub shaft in a lateral position, the *second* bevel gear *(28)* on the hub shaft meshing at its lower portion with the bevel gear *(24)* on the bevel pinion shaft *(22)*, [the second-mentioned case being] *said upper portion of said cover being* fitted over the pin portion *(19)* of the *first* gear case [and around] *with said intermediate portion fitting around and supported by a first bearing on* a lower portion of [the] *said* bevel pinion shaft *with said bottom portion of said cover fitting around and supported by a second bearing on an end portion of said bevel pinion shaft (22)* so as to [hold] *support* the *second* gear case from above and below, the *second* gear case being turnable about a vertical axis *defined by said bevel pinion shaft.*

B1 4,042,890 (772nd)

HIGH EFFICIENCY ELECTRICAL POWER CONDITIONER

Joseph S. Eckerle, Star Rte. 2, La Honda, Calif. 94020

Reexamination Request No. 90/000,749, Mar. 28, 1985.
Reexamination Certificate for Patent No. 4,042,890, issued Aug. 16, 1977, Ser. No. 686,332, May 14, 1976.
Int. Cl.[4] H03F *3/38, 21/00*
U.S. Cl. 330—207 A



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–16 are cancelled.

[1. A high efficiency power conditioner for providing power amplification of relatively low power input signals, said power conditioner comprising:

power input terminal means adapted to be coupled to an AC voltage source of electrical power;

high power signal output terminal means adapted to be coupled to a utilization device;

means coupled to said power input terminal means for converting AC voltages supplied thereto to first and second relatively high DC voltages of different levels, said converting means having first and second output terminals for said first and second relatively high DC voltages, respectively;

controllable switch means having first and second power input terminals coupled respectively to said first and second output terminals of said converting means, an output terminal coupled to said high power signal output terminal means and a control input terminal, said switch means including means responsive to signals present on said control input terminal for alternately coupling said first and second DC voltages of different levels to said output terminal thereof; and

signal processing means having a first input adapted to be coupled to a source of said relatively low power input control signals, a second input coupled to said high power signal output terminal as a feedback signal path, and an output terminal coupled to said control input terminal of said switch means, said signal processor including means for generating relatively low power control signals from said input control signals and a portion of those signals present on the feedback signal path for controlling the state of said switch means, said switch means alternately coupling said first and second DC voltages of different levels to said output terminal thereof in response to said relatively low power control signals from said signal processing means.]

B1 4,337,805 (773rd)

AGRICULTURAL BAG LOADING APPARATUS

William C. Johnson, Omaha; David H. Rasmussen, Arlington, both of Nebr., and Richard H. Lee, Astoria, Oreg., assignors to AG-Bag Corporation, Arlington, Nebr.

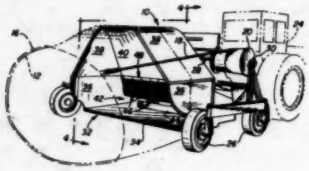
Reexamination Request Nos. 90/000,707, Jan. 8, 1985 and 90/000,997, Apr. 28, 1986.

Reexamination Certificate for Patent No. 4,337,805, issued Jul. 6, 1982, Ser. No. 212,606, Dec. 3, 1980.

Continuation of Ser. No. 32,766, Apr. 24, 1979, abandoned. This

Int. Cl.[4] B65B *1/24*

U.S. Cl. 141—71



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–16** and **32–35** is confirmed.

Claim **26** is cancelled.

Claims **17**, **18**, **20**, **23–25** and **27** are determined to be patentable as amended.

Claims **19**, **21**, **22** and **28–31**, dependent on an amended claim, are determined to be patentable.

17. In an agricultural bag loading apparatus having a primary shaft rotatably mounted therein in which silage and the like is forced into an agricultural bag *having a predetermined length* by a plurality of teeth mounted along the primary shaft when the shaft is rotated, the improvement comprising:

at least one drum rotatably mounted on the loading apparatus;

brake means for resisting the rotation of said drum with a selected brake force;

a cable *having a working portion equal in length to the agricultural bag, said working portion being initially* wrapped around said drum in a single layer to prevent excessive wear of said cable; and

means for securing the end of said cable to restrain the end of said bag so that the cable is pulled off the drum against the brake force of said brake means as the agricultural bag is filled with silage[.];

wherein said plurality of teeth are arranged in sets with the teeth of each set being substantially circumferentially spaced from the teeth of the next adjacent set such that the leading edge of each tooth in a set does not coincide horizontally with the leading edge of any tooth in the next adjacent set, whereby teeth of adjacent sets do not engage the silage sequentially.

REISSUES

OCTOBER 20, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,522
HAY RAKE

Byron L. Fishbaugh, St. Marys, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Original No. 4,481,758, dated Nov. 13, 1984, Ser. No. 474,616, Mar. 11, 1983. Application for reissue Jul. 25, 1986, Ser. No. 889,555

Int. Cl.[4] A01D *80/02*

U.S. Cl. 56—400 **6 Claims**

5. A hay rake tooth assembly for use on an agricultural rake comprising:

an elastomeric body having means for securing said hay rake tooth assembly to said agricultural rake;

an elongated rake tine having one end embedded in said elastomeric body, said end embedded in said elastomeric body having a bent around portion which forms a connecting passage therethrough, said elastomeric body including an elastomeric linking member filling said connecting passage and forming an integral part of said elastomeric body, said bent around portion extending at a substantially circular arc of at least 270°.

Re. 32,523
SOLAR HEATING

Marlene Resnick, 51 Pettee St., #12, Newton Upper Falls, Mass. 02164, and Roger C. Sturtevant, P.O. Box 972, South Carver, Mass. 02366

Original No. 4,494,527, dated Jan. 22, 1985, Ser. No. 448,923, Dec. 13, 1982. Application for reissue Aug. 8, 1986, Ser. No. 894,578

Int. Cl.[4] F24J *3/02*

U.S. Cl. 126—422 **12 Claims**

1. Solar heating apparatus for exchanging energy through double-hung window openings comprising,

means defining a solar collector chamber means for heating air therein in response to solar energy,

said solar collector chamber means having inlet means at the bottom for receiving cool air and outlet means at the top for expelling warm air,

inlet conduit means adapted to pass through an opening at the bottom of a double-hung window between the lower sash of said window and the window sill for coupling said inlet means to the inside of a building through said bottom opening and receiving cool air therethrough for warming in said solar collector chamber means,

and outlet conduit means for coupling said outlet to the inside of said building through an opening at the top in said double-hung window between the upper sash of said window and the top of the window frame for delivering warm air to said building expelled through said outlet means,

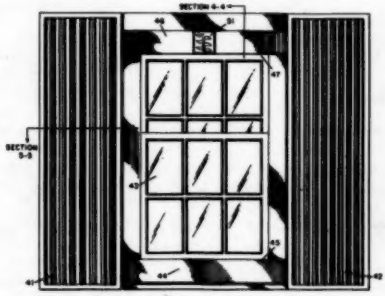
said outlet conduit means being above said inlet conduit means,

said solar collector chamber means being adapted for positioning beside said double-hung window with said outlet conduit means adapted for insertion through said top opening and said inlet conduit means adapted for insertion through said bottom opening without appreciably obstructing the view through said double-hung window except through said top and bottom openings with the unobstructed viewing area through said window being significantly greater than the area of said top and bottom openings,

said solar collector chamber means comprising solar collector chambers separated by the window width adjacent to each side of said window and intercoupled at the top by said outlet conduit means and at the bottom by said inlet conduit mean.

5. Solar heating apparatus for exchanging energy through openings near the top and bottom of a window comprising,

means defining a solar collector chamber means for heating air therein in response to solar energy,



said solar collector chamber means having inlet means at one of the top and bottom for receiving cool air and outlet means at the other of said top and bottom for expelling warm air forming a window shutter means for being positioned beside a window,

inlet conduit means adapted to pass through an inlet opening near one of the top and bottom of a window for coupling said inlet means to the inside of a building through said inlet opening and receiving cool air therethrough for warming in said solar collector chamber means,

and outlet conduit means for coupling said outlet to the inside of said building through an outlet opening near the other of said top and bottom of said window for delivering warm air to said building expelled through said outlet means,

said outlet conduit means being at a height different from said inlet conduit means and separated therefrom by a distance of the order of the height of said window,

said solar collector chamber means being adapted for positioning beside said window with said outlet conduit means adapted for insertion through said outlet opening and said inlet conduit means adapted for insertion through said inlet opening without appreciably obstructing the view through said window with the unobstructed viewing area through said window being significantly greater than the area of said inlet and outlet openings.

said solar collector chamber means comprising solar collecting chambers separated by the window width adjacent to each side of said window.

Re. 32,524

ADJUSTABLE SEAT BELT ANCHORAGE

John D. Temple, Carlisle, England, assignor to Ase (UK) Limited, Cumbria, England

Original No. 4,508,363, dated Apr. 2, 1985, Ser. No. 465,610, Feb. 10, 1983. Application for reissue Feb. 14, 1986, Ser. No. 829,610

Claims priority, application United Kingdom, Feb. 11, 1982, 8203979

Int. Cl.[4] A62B *35/02*

U.S. Cl. 280—808 **8 Claims**

1. Anchorage means for a belt of a seat belt system, said anchorage means comprising:

carriage means having support means for said belt,

track means for guiding said carriage means for movement therealong,

said track means comprising a rear wall portion extending longitudinally of said track means,

locking means for locking said carriage means against said movement along said track means,

said locking means comprising a first locking element on said carriage means and a series of second locking elements spaced along said track means,

said carriage means being rockable between a first position in which said first locking element is in engagement with a selected second locking position to lock said carriage means at a selected position on said track means and against said movement along said track means from said selected position and a second position in which said first locking element is released from said second locking element to permit said movement of said carriage means along said track means to a different selected position on said track means, and

resilient biassing means [biasing] *acting directly between said rear wall portion and said carriage means to bias* said carriage means into *its* said first position.

Re. 32,525

UNIVERSAL INTRAOCULAR LENS AND A METHOD OF MEASURING AN EYE CHAMBER SIZE

Jaswant S. Pannu, 6120 Almond Ter., Plantation, Fla. 33317

Original No. 4,435,855, dated Mar. 13, 1984, Ser. No. 261,953, May 8, 1981. Continuation-in-part of Ser. No. 136,243, Apr. 1, 1980, abandoned. Application for reissue Nov. 13, 1985, Ser. No. 797,656

Int. Cl.[4] A61F *2/16;* **A61B** *5/10*

U.S. Cl. 623—6 **11 Claims**

1. An intraocular lens comprising:

a lens body;

at least two spaced flexible positioning and supporting elements integrally formed with said lens body as a one-piece construction and extending radially, outwardly from the periphery of said lens body;

said elements [defining a continuous, substantially circular arc having a diameter greater than the diameter of said lens body, said arc curved toward said lens circumference and] terminating in a free end spaced from said periphery; and

snag-resistant means integrally formed on the free end of *each of* said elements for smoothly guiding and positioning the lens across contacted eye tissue when implanting the

lens, said snag resistant means having an uninterrupted, continuously, smoothly curved outer periphery which merges with said free end and is [substantially] *at least three times* greater in [size] *width* than the width of said flexible elements, *said snag resistant elements and said positioning and supporting elements being substantially coplanar.*

Re. 32,526

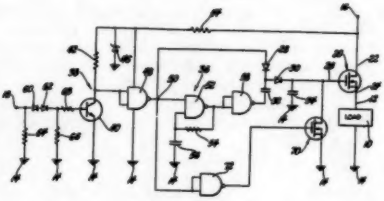
GATED SOLID STATE FET RELAY

Peter A. Hochstein, 2966 River Valley Dr., Troy, Mich. 48098

Original No. 4,603,269, dated Jul. 29, 1986, Ser. No. 624,277, Jun. 25, 1984. Application for reissue Nov. 24, 1986, Ser. No. 934,550

Int. Cl.[4] H03K *17/00, 5/22, 17/56*

U.S. Cl. 307—571 **14 Claims**



1. A solid state relay circuit for switching power to an electrical load (10) comprising; a load lead (12) for connection to the electrical load (10), a positive supply lead (16) for connection to a source of positive electrical potential, a control signal lead (18), an N-channel MOS-FET (20) having drain (22) and source (24) and gate (26) terminals with said drain terminal (22) connected to said positive power supply lead (16) and said source terminal (24) connected to said load lead (12), [characterized by] gated oscillator means (36) [receiving power from said power supply lead (16) and] connected to said control signal lead (18) and having an output terminal and for oscillating to produce a voltage at said output terminal and to cease oscillating to terminate voltage at said output terminal in response to electrical signals on said control signal lead (18), and voltage multiplier means (28, 30, 32, 34) interconnecting said oscillator output terminal and said gate (26) of said MOS-FET (20) for multiplying said output voltage from said oscillating means (36) for driving said MOS-FET (20) into conduction to power the load during oscillation of said oscillation means (36) [.] *and characterized by slow change means for controlling the rate of change of the conduction of said MOS-FET (20) to a slow rate of change between zero and full conduction.*

Re. 32,527

FET MICROWAVE OSCILLATOR BEING FREQUENCY STABILIZED BY CAPACITIVE REACTANCE MICRO-STRIP STUB LINE

Keiro Shinkawa; Masaki Noda, and Chuichi Sodeyama, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,435,688, dated Mar. 6, 1984, Ser. No. 286,511, Jul. 24, 1981. Application for reissue Mar. 6, 1986, Ser. No. 837,040

Claims priority, application Japan, Jul. 25, 1980, 55-101309

Int. Cl.[4] H03B *5/18*

U.S. Cl. 331—99 **15 Claims**

1. A microwave oscillator comprising:

a FET having source, drain and gate terminals;

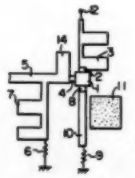
a micro-strip line connected to said drain terminal, said micro-strip line being grounded at microwave frequencies;

an output line made of a micro-strip line, said output line being connected to the source terminal of said FET;

a gate line made of a micro-strip line, said gate line being connected to the gate terminal of said FET;

a dielectric resonator disposed adjacent to said gate line and electrically coupled therewith and;

a capacitive stub disposed adjacent to said FET and formed by



a micro-strip line of which one end is connected to the source terminal of said FET and the other end is opened [, said capacitive stub being a source terminal ground at microwave frequencies].

PLANT PATENTS

GRANTED OCTOBER 20, 1987

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,039

AMELANCHIER TREE NAMED "PRINCE CHARLES"

Thomas Watson, 1746 Highway 73, Cambridge, Wis. 53523

Filed Feb. 26, 1985, Ser. No. 705,615
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of *Amelanchier laevis,* substantially as herein shown and described, characterized particularly as to novelty by unfolding flowers prior to unfolding leaves.

6,040

AMELANCHIER SHRUB NAMED "PRINCE WILLIAM"

Thomas Watson, 1746 Highway 73, Cambridge, Wis. 53523

Filed Feb. 26, 1985, Ser. No. 705,616
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of *Amelanchier canadensis,* substantially as herein shown and described, characterized particularly as to novelty by its large flowers averaging 2 centimeters in diameter, its unique, full form, densely packed large, sweet fruit, up to ½" in size, easily picked, and thick glossy leaves which can withstand hot and humid summers without defoliating.

6,041

AMELANCHIER NAMED "PRINCESS DIANA"

Thomas Watson, 1746 Hwy. 73, Cambridge, Wis. 53523

Filed Feb. 26, 1985, Ser. No. 705,617
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of *Amelanchier grandiflora* substantially as herein shown and described, characterized particularly as to novelty by its unique yellow flower buds which unfold to white flowers, brilliant red fall foliage, and wide-spread branches.

6,042

CACTACEAE PLANT

Barnell L. Cobia, Winter Garden, Fla., assignor to B. L. Cobia, Inc., Winter Garden, Fla.

Filed May 30, 1985, Ser. No. 739,441
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 1 Claim

1. The new and distinct plant variety of the Cactaceae family as described and illustrated and which is principally distinguished by a growth habit combining the following characteristics

(1) about the same growth rate, tendency to branch when pruned, and specimen size at comparable stages of maturity as is evident in the 'Lavender Doll' variety,

(2) a greater natural tendency to branch without pruning and a much greater tendency to form more compact specimens with a more upright and erect posture at maturity than the 'Lavender Doll' variety, the phylloclades being usually shorter in length and narrower in width than those of the 'Lavender Doll' variety,

(3) a greater resistance to bud abscission and slightly greater tendency to form multiple buds on the branch tips than the 'Lavender Doll' variety,

(4) a habit of producing more blooms with about the same bloom life and at a noticeably earlier date in the blooming season on specimens of comparable maturity and size when compared with the 'Lavender Doll' variety,

(5) a slightly greater resistance to nutrient deficiencies and to known problem diseases of the related varieties as compared to the 'Lavender Doll' variety,

(6) a bloom which in color closely resembles the bloom of the 'Lavender Doll' variety but which, at full bloom, appears more robust and may be distinguished therefrom by

(a) a sepaloid series of tepals that have a smaller number of tepals, and tepals with shorter length dimensions and narrower blade widths,

(b) a tube laminating series of tepals that have tepals with shorter length dimensions,

(c) a tube forming series of tepals that have tepals with longer length dimensions and slightly greater blade widths, and

(d) a perianth tube which is conspicuously shorter in length,

(7) sterile specimens.

PATENTS

GRANTED OCT. 20, 1987

ERRATA

For CLASS	See PATENT NO.
437-024	4,700,454
437-039	4,700,455
437-054	4,700,456
437-052	4,700,457
437-083	4,700,458
437-053	4,700,459
437-081	4,700,460
437-041	4,700,461
437-187	4,700,462
437-002	4,700,463
437-067	4,700,464
437-020	4,700,465
437-247	4,700,466
437-209	4,700,467
033-366	4,700,497
092-118	4,700,616
101-350	4,700,631
177-245	4,700,656
164-244	4,700,760
439-276	4,700,995
439-268	4,700,996
439-372	4,700,997
439-325	4,700,998
439-271	4,700,999
439-423	4,701,000
439-426	4,701,002
439-680	4,701,003
439-871	4,701,004
430-196	4,701,300
437-246	4,701,346
335-079	4,701,721
350-244	4,701,800
346-076	4,701,836
346-135	4,701,837

PATENTS

GRANTED OCTOBER 20, 1987

GENERAL AND MECHANICAL

4,700,403

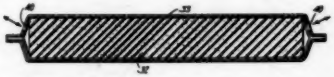
PROTECTIVE CUSHION

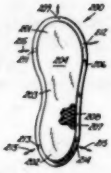
Eugene J. Vacanti, Eden Prairie, Minn., assignor to Sports Marketing, Inc., Eden Prairie, Minn.

Continuation of Ser. No. 726,132, Apr. 23, 1985, abandoned, which is a continuation-in-part of Ser. No. 409,014, Aug. 17, 1982, Pat. No. 4,512,037. This application Dec. 5, 1986, Ser. No. 939,258

Int. Cl.[4] A41D *13/00;* **A43B** *13/38*

U.S. Cl. 2—2 **32 Claims**





1. A protective cushion for protection of a human body part from injury comprising: flexible case means having an outer periphery shaped to conform to the part of the body that is to be protected, said case means having air impervious flexible first and second sheet members enclosing a single internal chamber, said sheet members having adjacent outer peripheral edges sealed together whereby said sheet members are flexible walls surrounding said internal chamber, said sealed outer peripheral edges having opposite ends and opposite sides, pad means of compressible open cell plastic material located within said chamber, said pad means being of a size to substantially fill said internal chamber, said chamber having internal dimension less than the fully expanded corresponding dimension of the pad means whereby the pad means is retained under partial compression within the chamber by the walls of the case means, said outer peripheral edges having at least one opening in the sealed portion thereof to allow restricted air flow into and out of the chamber and the open cell material of the pad means and regulate the pressure of the air in the open cells of the material of the pad means whereby the pad means and air in the open cells of the pad means simulatneously absorb and distributes impact forces applied thereto.

4,700,404

GOALKEEPER GLOVE

François Potvin, 51 Rochelle Drive, Guelph, Ontario, Canada N1K 1G6

Filed Nov. 20, 1986, Ser. No. 932,664

Int. Cl.[4] A41D *13/10*

U.S. Cl. 2—16 **7 Claims**

1. The combination of a goaltender glove having a hand inlet opening at one end and finger sheaths at the other end, with a blocking pad attached to the back of said glove, said pad having an outer wall, of generally rectangular shape, and facing away from said glove, said outer wall having a front end portion, a major intermediate portion and a rear end portion, said front end portion and said rear end portion protruding from said finger sheaths and hand inlet opening, respectively, said outer wall being generally straight transversely thereof, and being longitudinally curved, the radius of curvature of said outer wall being substantially uniform throughout the length of said front end portion and major intermediate portion, respectively, said rear end portion being inclined relative to said major intermediate portion and protruding from said outer wall.

4,700,405

BASEBALL GLOVE

Joseph E. Sternberg, 2198 Sycamore Hill Ct., Chesterfield, Mo. 63017

Filed Feb. 4, 1986, Ser. No. 825,854

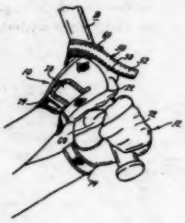
Int. Cl.[4] A41D *13/08*

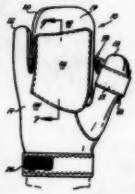
U.S. Cl. 2—19 **13 Claims**

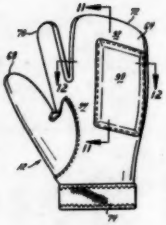
1. A batting aid comprising:

a right hand glove including a first thumb stall, a second adjacent finger stall accommodating at least the index finger, a palm portion disposed below the second finger stall, a bat-engageable web extending between the thumb stall and the second stall, said web having opposed ends

and being adjustable at least at one end to suit the wearer to effectively connect the first and second stalls, and a







bat-engageable cushioning pad disposed on the second finger stall.

4,700,406

ADJUSTABLY WRAPPABLE, STRETCHABLE STRAP FOR SHIN GUARD

William R. Meistrell, Manhattan Beach, Calif., assignor to Dive N'Surf, Inc., Hermosa Beach, Calif.

Continuation-in-part of Ser. No. 687,909, Dec. 31, 1984, Pat. No. 4,585,003. This application Feb. 12, 1986, Ser. No. 828,944

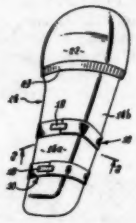
Int. Cl.[4] A41D *13/06;* **A41F** *9/00*

U.S. Cl. 2—22 **3 Claims**

1. Adjustable wrap means for wrapping about an athlete's shin guard whereby the tightness of the guard on the shin may be quickly adjusted, and in combination with said shin guard, said means comprising

(a) two like, elongated, flexible, relatively thin straps each of which is bidirectionally stretchable, each strap including a first foam rubber layer, and a second layer of stretchable pile fabric attached to and substantially covering the entire outer side of the first layer, each strap having a length between 10 and 24 inches, and a width between ¼ and 3 inches, the foam rubber thickness being between about 1/32 and ¼ inch,

(b) each strap adjustably wrapped and adjustably tensioned, about said guard with said pile fabric presented outwardly, and tab means on each strap carrying hook elements, the tab means hook elements attached to an end portion of the strap second layer and projecting beyond said end portion to removably attach to said second layer at any selected position of wrap adjustment of the endwise tensioned strap,



(c) said two straps spaced about and along the length of the shin guard, each shin guard being U-shaped in cross section along its length, there being U-shaped padding carried within a relatively stiff molded plastic outer section, one strap locally and adjustably compressively deflecting the guard and padding to greater extent than another strap.

4,700,407

PROTECTIVE GARMENT

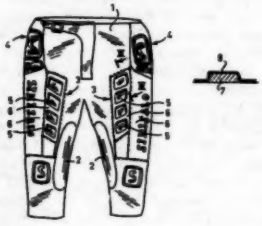
Heikki Mattila, Puolanka, Finland, assignor to Sinisalo Sport OY, Puolanka, Finland

Filed Aug. 15, 1986, Ser. No. 897,020

Claims priority, application Finland, Jun. 26, 1986, 862735

Int. Cl.[4] A41D *13/00, 27/26*

U.S. Cl. 2—23 **4 Claims**



1. A protective garment, especially a sports garment, comprising a layer formed of a wear-resistant, resilient basic material protecting the person who wears the garment, said garment being provided with resilient, shock-absorbing pads which are fitted in openings formed in the basic material and fastened stationarily flush with the basic material in such a manner that part of the layer protecting the person wearing the garment is formed solely by the pads.

4,700,408

PACIFIER HOLDER FOR INFANTS

Patricia A. Winger, 8 Stanson Close, Kitchener, Ontario, Canada (N2G 3W6)

Filed May 4, 1987, Ser. No. 46,001

Claims priority, application Canada, May 30, 1986, 510530

Int. Cl.[4] A41B *13/10*

U.S. Cl. 2—49 R **4 Claims**

1. A holder for a pacifier or the like, substantially Y-shaped, the upper arms of the Y-shape constituting attachment means

for fastening the holder around an infant's neck, the distal ends of said upper arms being provided with fastening means for fastening each to the other, and the base leg of the Y-shape constituting a retaining strap for the pacifier or the like, fastening means near the distal end of said retaining strap being provided whereby said distal end may be formed back onto itself to form a loop for engaging the ring of the pacifier or the like.

4,700,409

CONVERTIBLE GARMENT

Stuart C. De Lott, Great Neck, N.Y., assignor to Wingspread Corporation, New York, N.Y.

Filed Jan. 8, 1987, Ser. No. 1,460
Int. Cl.[4] A41D *1/00*
U.S. Cl. 2—94 **7 Claims**

1. A convertible garment of the type including a back section, at least one front section, and arm holes positioned adjacent a yoke of said garment, said back panel section including:

an outer continuous rear wall panel extending across the back face of said garment and having a lower free edge;

a first inner rear panel section positioned adjacent said outer rear wall panel and extending downwardly from a collar portion of said garment to a position intermediate said armholes, said first inner panel section terminating in a lower free edge extending transversely of said garment and between said arm holes;

a second inner rear panel section positioned adjacent said outer rear wall panel and extending downwardly from an upper free edge of said second inner rear panel section aligned with said lower free edge of said first inner rear panel section, said second inner rear panel section terminating at a lower edge thereof substantially in alignment with said lower free edge of said outer rear wall panel;

a pouch structure comprised of substantially parallel sheets of fabric material positioned between said outer rear wall panel and said second inner rear wall panel section, said pouch having top, bottom and side edges and being closed at said side edges and at said bottom edge;

the respective top edges of said pouch respectively being connected to said lower edge of said first inner rear panel section and said upper edge of said second inner rear panel section, said pouch extending substantially the entire height and width of said second inner rear panel section; and,

fastener means for detachably attaching said lower edge of said first inner rear panel section to said upper edge of said second inner rear panel section; whereby,

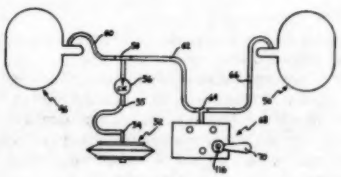
upon separation of said fastener means, said pouch can be inverted and withdrawn between said respective lower and upper edges of said respective first and second inner rear panel sections for it to be employed as a storage bag for said garment when said garment is appropriately folded, said storage bag provided by said pouch having an internal volume in excess of the volume of said folded garment.

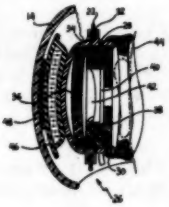
4,700,410

PNEUMATIC ADJUSTMENT MEANS FOR EARCUPS IN HELMETS

Charles A. Westgate, Uniondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.

Filed Jul. 10, 1986, Ser. No. 884,099
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—423 **10 Claims**





4. A self-contained protective helment and sound-attenuating earcup and earcup adjusting assembly including in combination, a relatively rigid outer shell formed with a pair of ear portions, said shell adapted to fit over the wearer's head, a pair of sound-attenuating earcup subassemblies each having a relatively rigid earcup and a seal adapted to be brought into engagement with the wearer's head, means for suspending said earcup assemblies within said shell adjacent to said ear portions for movement toward and away from the wearer's head, respective inflatable bodies disposed between said ear portions and said earcups adapted to be inflated to urge said seals into engagement with the wearer's head, a manually operable pump comprising an actuating element and an outlet passag, means mounting said pump on said shell with said actuating element outside said shell and with said outlet passage opening to the inside of said shell, means within said shell for connecting said outlet passage to said inflatable bodies, a relief valve having an operating element adapted to be actuated to deflate said inflatable bodies, and means mounting said relief valve on said shell

with said operating element outside said shell at a location adjacent to one of said ear portions at which it is accessible to a wearer doffing said helmet assembly.

4,700,411

HELMET

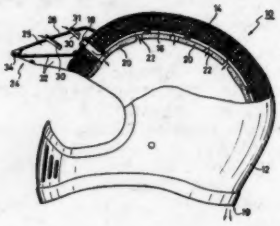
Kazuhiro Kawasaki, and Akio Muranaka, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1985, Ser. No. 798,605

Claims priority, application Japan, Nov. 16, 1984, 59-17318[U]

Int. Cl.[4] A42B 3/02

U.S. Cl. 2—425 3 Claims



1. A helmet comprising

a helmet body having ventilation and inlets through a forward portion of said helmet body; and

a visor extending forwardly of said helmet body and having an upper wall which inclines upwardly from its forward end towards said helmet body, and a bottom wall fixed to said upper wall, said bottom and upper walls together with said forward portion of said helmet body defining a generally triangular inner chamber therebetween in communication with said inlets, said upper wall having air guide openings into said inner chamber facing forwardly of said helmet body, said air guide openings being slots extending substanially across said upper wall, such that airborn particles in an air stream enterining said air guide openings are generally left in said inner chamber before the air stream enters said helmet body.

4,700,412

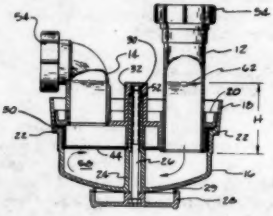
UNIVERSAL TRAP

John L. Manuel, Wichita, Kans., assignor to Gary Allred, Winfield, Kans.

Filed Mar. 3, 1986, Ser. No. 835,386

Int. Cl.[4] B01D 21/00

U.S. Cl. 4—207 12 Claims



1. A universal drain trap and separator comprising:

an arcuate-shaped bowl having an open top and a center post extending upwardly through the plane of the open top thereof;

a lid member removably engageable with the top of the bowl and the center post in sealing relation;

inlet conduit means attached to the lid and extending into the bowl for admission of fluids, solids and gases;

outlet conduit means attached to the lid connecting the trap to drain;

fastening means including a handle on the lower end thereof extending up through the center post for attachment to the lid; and

a peripheral lid means extending above the top of the bowl extending upwardly sufficiently such that when the bowl is removed from the lid, substantially all the fluid normally standing in both of said conduit means and said trap will be contained in the bowl.

4,700,413

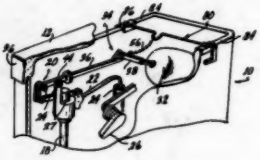
TOILET FLUSHING MECHANISM WITH HIGH/LOW WATER VOLUME SELECTABILITY

Conrad S. Lopez, 1312 N. Manzanita St., Los Angeles, Calif. 90027

Continuation of Ser. No. 679,090, Dec. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 532,451, Sep. 15, 1983, abandoned. This application May 9, 1986, Ser. No. 861,754

Int. Cl.[4] E03D 1/36

U.S. Cl. 4—324 4 Claims



1. A sanitary toilet flushing mechanism with water level selectability comprising:

a water tank;

a water inlet into said tank;

a ball-cock valve normally closing said water inlet;

a float;

first and second arm sections connected for flexing movement in a vertical plane within said water tank;

said first arm section being attached to the ball-cock valve and the second arm section being attached to the float;

latch means allowing flexing movement of said first and second arm sections in one direction from a first angular relationship through a second angular relationship, said latch means locking said arm sections at said second angular relationship against buoyancy of said float urging flexing movement of said arm sections in the opposite direction towards said first angular relationship; and

release means connected to said latch means actuatable from the exterior of said water tank for disengaging said latch means to thereby allow said first and second arm sections to return to said first angular relationship;

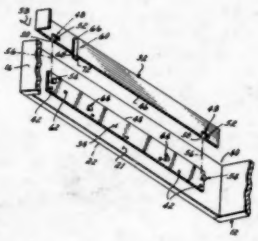
said release means comprising a pair of clips attachable to the rim of said water tank, an actuating rod rotatably supported between said clips, at least one end of said rod extending to the exterior of said water tank, lever means extending radially from said rod, and linkage means connecting said lever means to said latch means for releasing the latch means upon rotation of said rod.

4,700,414

SOFA-SLEEPER HAVING A SNAP-IN BOTTOM-LOADING SOFA BED MECHANISM

Danny C. Robinson, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Dec. 5, 1986, Ser. No. 938,585
Int. Cl.[4] A47C *17/04*
U.S. Cl. 5—13 **12 Claims**



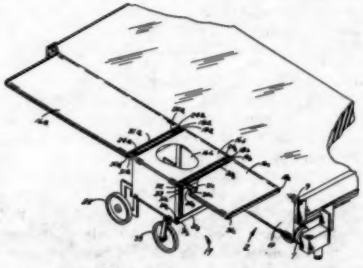
1. A sofa-sleeper comprising:
a stationary sofa frame having front, back and opposed sidewalls, each of said sidewalls having an interior surface,
a sofa bed mechanism having pivotally interconnected head, body, intermediate and foot sections, said mechanism being extendable to form a bed and foldable within said frame to form a seat,
two sofa bed mechanism support brackets, each mounted on the interior surface of one of said sidewalls,
two mounting plates, each pivotally connected to said head and body frame sections at a different side of said mechanism, each of said plates having an upwardly facing edge,
each of said plates having a horizontally spaced pair of L-shaped slots in the upwardly facing edge thereof,
each of said brackets having a horizontally spaced pair of wide-headed pins extending therefrom and through said slots,
whereby said mechanism when folded is removably connectable to said frame through the bottom thereof.

4,700,415

RECLINABLE WHEELCHAIR APPARATUS

Paul DiMatteo, Huntington, and Charles F. Chubb, Brookville, both of N.Y., assignors to Nova Technologies, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 731,533, May 7, 1985. This application Aug. 12, 1985, Ser. No. 764,941
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] A61G *7/08*
U.S. Cl. 5—81 R **29 Claims**



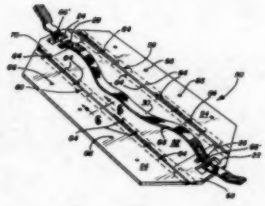
1. A reclinable wheelchair comprising; a back rest section, a seat section, and a leg rest section; conversion means for converting the wheelchair between an upright chair position and a reclined wheelchair position having an extended horizontal surface; means for positioning said wheelchair in said reclined position side-to-side with a bed on which a person lies; said bed having a sheet of material across the bed and means for pulling said sheet of material so as to move a person lying theron to and beyond a side of said bed; strips of flexible material passing over supporting members on each side of said wheelchair; ends of said strips being attached to and wound up on rollers; constraining means for supporting said strips in predetermined positions on the wheelchair; rotational means for moving said strips in either one of two directions; and power means for driving said rotational means.

4,700,416

PATIENT TRANSFER MAT

Paul J. Johansson, 1416 Grant Rd., Northbrook, Ill. 60062

Continuation-in-part of Ser. No. 830,261, Feb. 18, 1986. This application Jun. 2, 1986, Ser. No. 869,367
Int. Cl.[4] A61G *7/08*
U.S. Cl. 5—81 R **15 Claims**



1. An improved patient transfer mat comprising:
an elongated body portion having a substantially elongated rectangular shape adapted to be placed transversely under a selected portion of the torso of a patient to facilitate the moving of at least said torso portion of the patient, said body portion having a length substantially less than the length of the patient, but greater than the width of said torso portion and having a width substantially less than said length;
said body portion being formed from a flexible but substantially rigid lightweight material and including means to at least partially conform with the contour of a portion of the patient's body, said means to conform including a center section and a wing section hingedly attached by a hinge mechanism to each side of said center section, which wings pivot at an angle to said center section to provide said conformation and a sufficient sliding surface for moving said patient, said hinge mechanism formed by at least one flexible web molded into the adjacent edges of said sections; and openings in each end of said body portion adapted to be grasped by an attendant to move said patient.

4,700,417

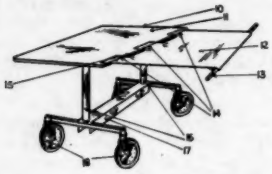
GURNEY EXTENSION

Lorayne McGovern, 73 Acorn St., Bridgeport, Conn. 06606

Filed Jul. 16, 1986, Ser. No. 886,016
Int. Cl.[4] A61G *7/10*
U.S. Cl. 5—81 R **5 Claims**

1. A means suitable for transferring a person from a stationary place onto a gurney comprising a gurney having a reinforcing bar along at least one side of its platform and having permanently attached to said reinforcing bar a flexible transfer sheet,

said transfer sheet having about the length of said platform, the width greater than that of a person and having at the opposite



side a holding means selected from the group consisting of loops, rings, ties and a bar.

4,700,418

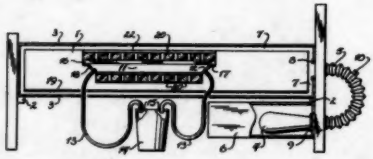
STERILE MATTRESS UNIT

Russell F. Ritter, 132 Concord Dr., Buffalo, N.Y. 14215

Continuation-in-part of Ser. No. 735,846, May 21, 1985, Pat. No. 4,620,333. This application May 5, 1986, Ser. No. 859,481

Int. Cl.[4] A47C *27/08*

U.S. Cl. 5—449 **12 Claims**



1. A substantially sterile mattress unit comprising a mattress, a micro-filter tight mattress cover enclosing said mattress and means to control the internal atmosphere of said cover, said means comprising at least one flexible reservoir for housing a gas, and an airtight conduit connecting said reservoir to the internal portion of said cover, said reservoir adapted to permit the free flow of said gas between itself and the internal portion of said cover, said gas permitted to flow through said conduit to and from said reservoir and said internal portion of said cover.

4,700,419

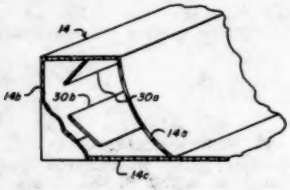
FLOATATION SLEEP SYSTEM INCLUDING A RECTILINEAR PERIMETER AIR CHAMBER

Philip J. Santo, 12 Mountin Rd., Rochester, N.Y. 14625

Continuation-in-part of Ser. No. 782,938, Oct. 2, 1985, abandoned. This application Dec. 1, 1986, Ser. No. 936,635

Int. Cl.[4] A47C *27/10*

U.S. Cl. 5—452 **24 Claims**



1. In a floatation sleep system including a liquid-containing bladder, an air chamber surrounding and supporting the marginal perimeter of said bladder, and substantially planar means for interconnecting opposed marginal perimeter supporting portions of said air chamber, means for maintaining the exterior of said air chamber in a substantially overall rectilinear configuration, said means comprising:

at least one tie member secured at one end to the inside surface of the exterior wall of said perimeter air chamber, and secured at its opposite end to a wall portion of said perimeter air chamber coextensive with said planar means.

4,700,420

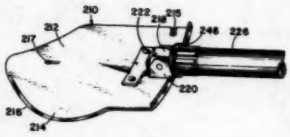
MULTI-PURPOSE CAMPING TOOL

John Belanger, 205 Well St., Crown Point, Ind. 46307

Continuation-in-part of Ser. No. 565,405, Dec. 27, 1983, abandoned. This application Mar. 11, 1985, Ser. No. 710,562

Int. Cl.[4] B25F *1/02*

U.S. Cl. 7—114 **20 Claims**



1. A connecting means for a plurality of pole components wherein each of said components being elongated members, and each end of each of said elongated members being longitudinally recessed to provide a cavity in the distal ends thereof, comprising:

a shaft having one end thereof secured in said cavity in one distal end of each of said plurality of elongated members, a major part of said shaft extending exterior of said cavity and longitudinally of said elongated member, the distal end of said shaft exterior of said cavity being slotted to provide circumferentially spaced longitudinal projections, and a circumferential collar provided adjacent the base of said projections;

a sleeve member rotatably mounted on said shaft, one end of said sleeve member abutting said one distal end of the elongated member and the other end of said sleeve member abutting the circumferential collar adjacent the base of said projections of said shaft, said other end of said sleeve member being threaded and provided with a circumferential collar adjacent said threaded end;

a pin diametrically fixed in the other distal end of each of said plurality of elongated members extending through said cavity; and

a coupling sleeve having one end thereof secured in said cavity in the other distal end of each of said plurality of elongated members by said pin, the other end of said coupling sleeve being internally threaded to threadedly receive the threaded end of said sleeve member provided on another of said plurality of elongated members, said threaded connection positioning said pin connecting said coupling sleeve in said cavity in said slot of said shaft, and abutting said other end of said coupling sleeve to said collar of said sleeve member.

4,700,421

RAMP FOR LOADING SMALL MOTORIZED VEHICLES ON PICKUP TRUCKS

Tommy C. Gladney, P.O. Box 363, and William E. Baker, Rt. 3, Box 299, both of Eupora, Miss. 39744

Filed Feb. 24, 1986, Ser. No. 832,062

Int. Cl.[4] E01D *1/00*

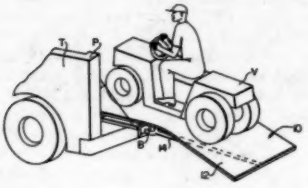
U.S. Cl. 14—69.5 **19 Claims**

1. A ramp assembly for loading relatively small motorized vehicles on, and unloading such vehicles from, the loading bed of relatively larger motorized vehicles of the type including a ball hitch so that such a relatively small vehicle can be transported by the larger vehicle, said ramp assembly comprising:

a flexible support sheet which, in use, extends between the

bed of the larger vehicle and the ground to form a ramp, said support sheet being of a flexible construction which is capable of being rolled up when not in use;

means for securing one end of the support sheet on the bed of the larger vehicle; and



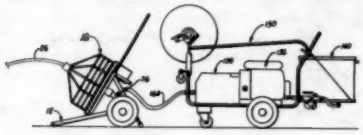
means, comprising an elongate tensioning member extending between the larger vehicle and the other end of the support sheet, for tensioning and supporting the support sheet so that the support sheet is held taut and thereby forms the ramp, said elongate tensioning member including means engaging the ball hitch of the larger vehicle.

4,700,422

MULTIPLE USE DRAIN CLEANING APPARATUS

V. Lee Russell, 4440 NW. 11th Ter., Oklahoma City, Okla. 73107

Filed Oct. 2, 1985, Ser. No. 783,741
Int. Cl.[4] B08B *9/02*
U.S. Cl. 15—104.3 SN **17 Claims**



1. A multiple use drain cleaning apparatus for cleaning a drain pipe, comprising:

a frame assembly having a plurality of frame members and a wheel assembly supporting the frame members;

a drum assembly supported by the frame assembly comprising a payout drum, a rotatable drive shaft, and a truck support assembly, the payout drum supported by the drive shaft, the truck support assembly supporting the payout drum and supportable by the frame assembly and selectively removable therefrom, the truck support assembly having a wheel assembly and frame members forming handle portions so that the truck support assembly is usable to support the payout drum separated from the frame assembly;

a snake hose supported by the payout drum, the hose having a near end attached to the rotatable drive shaft and a free end with a nozzle extendable into the drain line;

pump means for pressurizing and communicating a fluid to the hose for discharge by the nozzle at the free end of the snake hose, the pump means comprising a pump supported by the frame assembly, the pump having an inlet port and an outlet port;

fluid means for supplying multiple fluids to dispense;

conduit means for communicating the fluids in selective proportions to the pump inlet port; and

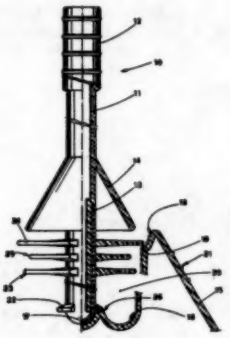
power means supported by the frame assembly for selectively driving the pump.

4,700,423

LAVATORY BRUSH

Alessandro Zuliani, Udine, Italy, assignor to Cosatto SpA, Martignacco, Italy

Filed Aug. 1, 1985, Ser. No. 761,634
Claims priority, application Italy, Sep. 3, 1984, 60436/84[U]
Int. Cl.[4] A46B *9/02*
U.S. Cl. 15—160 **20 Claims**



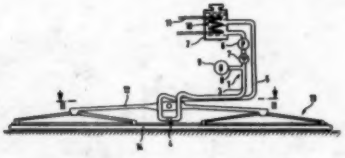
12. A lavatory brush set, comprising an elongate handle having a hand grip adjacent one end thereof and a plurality of axially stacked, flexible cleaner blades adjacent the other end theroof, each blade having portions distributed circumferentially around the handle, said blades extending substantially radially outward from the handle and being of a flexible material, each blade having a root portion at which it is fixed to the handle and a peripheral portion remote from the handle, in which the diameters of said cleaner blades vary axially of the handle, with the maximum diameter in the middle of said stack of cleaner blades, a side view of said stack of cleaner blades presenting a convexly rounded profile.

4,700,424

WINDSHIELD WASHING SYSTEM FOR MOTOR VEHICLES

Hans Hagen, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 2, 1986, Ser. No. 847,262
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512108
Int. Cl.[4] B60S *1/48*
U.S. Cl. 15—250.04 **11 Claims**



1. A pressurized windshield washing installation for motor vehicles, comprising a reservoir tank, pressure responsive spray nozzle means, line means arranged between the reservoir tank and the spray nozzle means for supplying pressurized washing liquid, heating means for heating the washing liquid, said line means forming part of a closed circulatory system for the pressurized washing liquid that extends from the spray nozzle means by way of a return line back to the reservoir tank, selectively controlled pressure producing means acting upon

the pressurized washing liquid to increase the pressure of the pressurized washing liquid and the pressure responsive spray nozzle means being responsive to the increased pressure caused by the pressure responsive means to permit washing liquid to leave the closed circuit only when the pressurized washing liquid is acted upon by the selectively controlled pressure producing means.

4,700,425

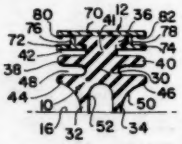
WIPER ELEMENT AND HOLDER

Mark A. Rusnak, 39 Buchanan Dr., Virginia Beach, Va. 23456

Filed Jan. 21, 1986, Ser. No. 820,360

Int. Cl.[4] B60S *1/38*

U.S. Cl. 15—250.41 **12 Claims**



1. A wiper element formed of a resilient, flexible material for wiping a window, such as a windshield or rear window of a vehicle, comprised of an elongated member including a body portion, a strip extending along one side of the body portion, a neck connecting the strip and body portion forming a gap on each side of the neck, a pair of wiper blades extending away from the body portion on the side of the body portion opposite the strip, said blades being spaced apart, in substantially parallel disposition and substantially coextensive in length to a blunt, wiping end, an extension along each side of the body portion adjacent the one side, each extension located adjacent the blades and each extension including an outer location connected with an outer edge of the blunt, wiping end of a wiper blade along a continuous, inwardly arcuate path to define the outer surface of each blade, and an inner edge of the blunt, wiping end of the wiper blades being connected along a continuous arcuate path to define the inner surface of each blade.

4,700,426

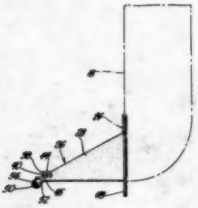
NOZZLE ASSEMBLY FOR FLUID STRIPPING APPARATUS

Lucian G. McElroy, 3315 Brocker Rd., Metamora, Mich. 48455

Filed Sep. 28, 1982, Ser. No. 426,108

Int. Cl.[4] B60S *3/04*

U.S. Cl. 15—316 R **13 Claims**



1. A nozzle assembly **(26)** to be connected to an outlet **(24)** of a flexible inflatable bag **(18,20)** having a substantially rectangular cross section of an apparatus **(10)** for emitting a stream of air under pressure therethrough to remove fluid from the surface of a vehicle, said assembly **(26)** comprising: an elongated body including a first pair of oppositely disposed walls **(28,30)** spaced a predetermined distance apart and a second pair of oppositely disposed walls **(32,34)** and spaced from each other a lesser distance than the spacing of said first pair of walls **(28,30)**, said body further including an outlet portion **(36)** defining a first elongated opening **(37)** and being adapted to be connected to the bag inlet **(24)** and a nozzle portion **(38)** defining a second opening **(40)** having a smaller area than said first elongated opening **(37)**; and characterized by vane means **(42)** extending between said second pair of walls **(32,34)** and into said nozzle portion **(38)** for preventing said second pair of walls **(32,34)** and said nozzle portion **(38)** from being forced apart by the pressure of the stream of air passing therethrough, said vane means **(42)** including a plurality of webs **(42)** extending between said second pair of walls **(32,34)** and into said nozzle portion **(38)** and being integral therewith, said second pair of walls **(32,34)** including an intermediate portion extending between said inlet portion **(36)** and said nozzle portion **(38)**, said intermediate portions converging towards each other from said inlet portion **(36)** to said nozzle portion **(38)**, said webs **(42)** being disposed between said intermediate portions and extending into said nozzle portion **(38)**, said nozzle portion **(38)** including lips **(44,46)** extending from each of said second pair of walls **(32,34)** and being substantially parallel relative to each other , said webs **(42)** extending between at least a portion of said lips **(44,46)**.

4,700,427

METHOD OF AUTOMATICALLY STEERING SELF-PROPELLED FLOOR-CLEANING MACHINES AND FLOOR-CLEANING MACHINE FOR PRACTICING THE METHOD

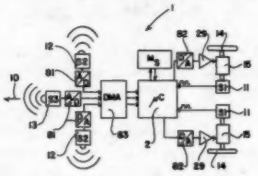
Hans-Reinhard Knepper, Pfalzgrafenstrasse 80, D-4200 Oberhausen, Fed. Rep. of Germany

Filed Oct. 15, 1986, Ser. No. 919,221

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1985, 3536973

Int. Cl.[4] B62D *11/04*

U.S. Cl. 15—319 **9 Claims**



1. A method of automatically steering a self-propelled floor-cleaning machine along a predetermined path of motion on a limited area to be worked, comprising:

retrieving a sequence of path segments stored in a data memory;

recognizing markings by at least one sensor on the machine;

converting said markings into course-correcting control commands steering the machine;

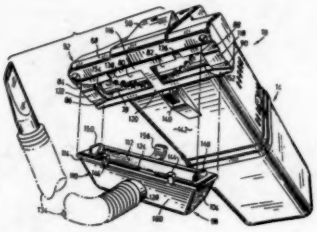
using linear structures present on or above the area to be worked as markings along the path of motion such that on first segments of its path the floor-cleaning machine is steered parallel to recognized structures by at least one laterally pointing telemeter, and that on second segments of its path the floor-cleaning machine travels freely without guidance by existing structures, from the end of a recognized structure to the beginning of the next structure which can be recognized.

4,700,428

HOSE ASSEMBLY FOR FLUID FLOW APPARATUS

Michael W. Hetherington, Ontario, Canada, assignor to Iona Appliances Inc./Appareils Iona Inc., Welland, Canada

Filed May 8, 1986, Ser. No. 860,913
Claims priority, application Canada, Dec. 2, 1985, 496686
Int. Cl.[4] A47L 5/32
U.S. Cl. 15—338 5 Claims



1. In apparatus wherein a fluid flow path is defined within a housing and leads from an inlet in said housing to an outlet therefrom, a hose assembly for extending the fluid flow path in said housing therebeyond including an elongated trough-like member having a side opening therein for establishing communication with a length of hose and a top opening therein remote from said side opening for overlying registration with said inlet and bounded by an edge formation projecting outwardly therearound, said edge formation having an extent and configuration to surround said inlet and bear against said housing when said top opening is presented in overlying registration thereto and means carried by said housing and said hose assembly resepectively for releasably securing said elongated trough-like member to said housing when said top opening therein is presented in overlying registration to said inlet of said housing, said means comprising a pair of spaced apart aligned hook-shaped projections upstanding from a portion of said edge formation and projecting outwardly thereabove on one side of said elongated trough-like member and means in said housing adjacent said inlet of a configuration and alignment for releasably receiving and holding said hook-shaped projections in pivoting engagement therewith and constraining same against withdrawal when said top opening is presented in overlying registration to said inlet, and an arm portion projecting outwardly from said trough-like member on the side thereof opposite said hook-shaped projections for releasably engaging with latch means carried by said housing.

4,700,429

QUICK RELEASE WAND FOR CANNISTER VACUUM CLEANER

William J. Martin, Watervliet, Mich., and John M. Chun, Mound, Minn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

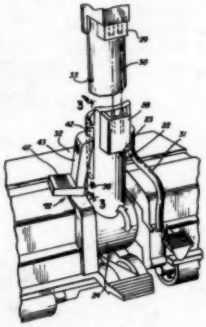
Filed Oct. 23, 1986, Ser. No. 922,395
Int. Cl.[4] A47L 9/24
U.S. Cl. 15—377 20 Claims

1. In a vacuum cleaner having a wheeled nozzle, and a tubular wand for providing suction to the nozzle, an improved quick connect/release connection means comprising:

a tubular connector swivelly mounted to said nozzle, said connector defining a distal end, a through opening spaced from said distal end, and a guide portion extending from said distal end to said opening;

means on said wand for locking an end portion of the wand received in said connector releasably to the connector including a latch and means resiliently biasing the latch to project outwardly from said end of the wand, said guide portion being arranged to guide said latch into said opening in the connector as a result of insertion of the wand end portion into the connector for releasably locking the wand end portion to the connector;

a release lever; and



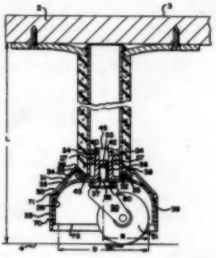
means for movably mounting said release lever to said connector, said release lever having a foot pedal portion engageable by a user's foot for urging said latch inwardly from said opening against the action of the biasing means to permit withdrawal of the wand end portion from the connector.

4,700,430

FURNITURE SUPPORT

William Raftery, 3101 Bridlegate Dr., Arlington, Tex. 76016

Filed Aug. 7, 1985, Ser. No. 763,820
Int. Cl.[4] B60B 33/00; A47B 91/06
U.S. Cl. 16—18 CG 4 Claims



1. A support for positioning an article of furniture above ground comprising:

a. a column depending downwardly from the article of furniture, said column having a bottom portion;

b. a caster removably secured to the bottom of the column in ground contacting position;

c. a shroud providing a semi-circular portion removably attached to the bottom of the column and encircling said caster above ground; and

d. a caster glide having means for a first stored position beneath said column within said shroud encircling said caster above the ground, and honing means for a second position partially removed from said shroud and encircling said caster and interposed between said caster and the ground.

4,700,431

PROCESS AND APPARATUS FOR ELIMINATING DUST FROM FIBER MATERIAL

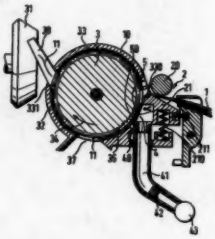
Peter Artzt, Reutlingen; Heinz Muller, Metzingen-Neuhausen; Kurt Ziegler, Kirchheim-Nabern; Gerhard Egbers, Reutlingen, all of Fed. Rep. of Germany, and Jacek Wokaun, Winterthur, Switzerland, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

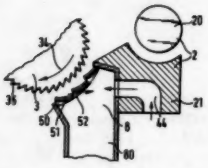
Filed Aug. 7, 1985, Ser. No. 763,345

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1984, 3429024

Int. Cl.[4] D01G *15/40;* D01H *7/882*

U.S. Cl. 19—105 **36 Claims**





1. A process for eliminating dust from fiber material, comprising the steps of:

guiding the fiber material in a defined fiber transport direction over a sieve-like surface having orifices inclined at an angle substantially parallel with the defined fiber transport direction;

exposing the fiber material to a suction airstream while it is guided over the orifice of the sieve-like surface; and

guiding the suction airstream, to which the fiber material is exposed in the region of the sieve-like surface, through the sieve-like surface orifices so that such suction airstream travels in a direction away from the fiber material at an angle substantially opposite to the transport direction of the fiber material over the sieve-like surface, whereby the suction airstream removes dust from said fiber material without disturbing the transport direction thereof.

4,700,432

BUNDLING TIE

Michael P. Fennell, 36 Merwin Ave., Fairfax, Calif. 94930

Filed Apr. 25, 1986, Ser. No. 856,535

Int. Cl.[4] B65D *63/00*

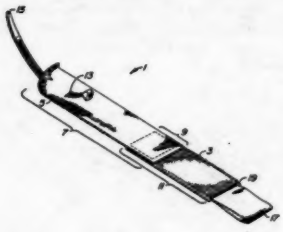
U.S. Cl. 24—16 R **4 Claims**

1. A detachable fastening device comprising:

a flexible strap member having first and second end portions;

means for attaching the first end portion of the strap member to the second portion of the strap member; and

means for securely, semipermanently attaching the strap member to an elongated member, wherein the means for securely, semipermanently attaching the strap member to an elongate member comprises a tie longitudinally inserted through a slot in one of the end portions of the strap member such that the tie is circumferentially engageable on a portion of the elongate member and securely, semi-



permanently attached the strap member to the elongate member when so engaged, said tie can only be removed with the aid of a tool.

4,700,433

DEVICE OF THE CLEVIS TYPE FOR HANDLING OPERATIONS

Francois Simon, "Lachat" Route de Mery, 73420 Mery par Viviers du Lac, France

Filed Aug. 6, 1986, Ser. No. 893,595

Int. Cl.[4] A63B *61/04;* B65D *63/00*

U.S. Cl. 24—68 B **8 Claims**

1. A tackle comprising:

at least three stems;

a clevis device having two of said at least three stems, said two stems having non-aligned parallel axes;

a second device having at least another one of said at least three stems;

two of said at least three stems having a longitudinal slot so as to constitute slit stems;

a flat flexible strap-like tie having non-treated free ends and extending between said clevis device and said second device, each end being secured against motion by friction engagement on respective ones of said two slits stems, such that each end penetrates a respective slot and is lockingly wound on a respective slit stem, and said tie having a portion thereof between said ends which extends about at least one other stem, each of the latter functioning as a return stem; and

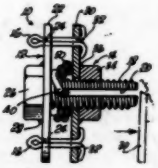
means for defining the angular position of said two slit stems about axes thereof.

4,700,434

LINE TIGHTENING MECHANISM

David G. Fambrough, 13205 S. Hills Dr., Reno, Nev. 89511

Filed Aug. 6, 1986, Ser. No. 893,663
Int. Cl.[4] A44B 21/00
U.S. Cl. 24—71.2 6 Claims



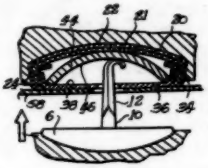
1. An apparatus for taking up the slack in loose lines which includes: A first and second set of circular disks in alignment with one another; said first disk comprising a tool receiving projection on a first flat face, a threaded and slotted stud affixed to and projection from the opposite flat face of said loose line being secured to the slotted portion of said stud during the tightening process; a threaded nut affixed to a flat face of said second disk opposite the face of said second circular disk; a plurality of openings spaced about the center of said first and second circular disks; an opening of sufficient size in said second circular disk in alignment with said threaded not to allow passage of said threaded and slotted stud; and pins for locking both first and second circular disks from rotation to one another said pins passing through aligned openings in said first and second circular disks.

4,700,435

TACK BUTTON

Earl D. Bush, Downers Grove, Ill., assignor to Handy Button Machine Company, Melrose Park, Ill.

Filed Oct. 6, 1986, Ser. No. 915,537
Int. Cl.[4] A44B 1/42
U.S. Cl. 24—94 4 Claims



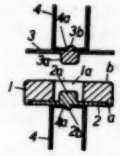
1. A button comprising a shell formed with a dome and a peripheral wall surrounding the dome, a cover lining the outside of the dome and wall and with said cover also extending into the interior of the shell against the inside surface of said wall, a backing member having a disc-like central portion and a flange surrounding said central portion, said flange lying within said shell and pressing against said covering and cooperating with said wall to clinch the covering material therebetween, an insert within said shell and having an arcuate interior surface presented toward said disc-like central portion, said insert having a peripheral portion adjacent to said flange and being surrounded thereby, said insert also having a central region engaging the inside surface of said dome and being sufficiently shallow to be wholly within the confines of said shell, a tack adapted to secure the aforesaid structure to a fabric sheet, said tack having a head, and a shank projecting from said head, said tack also having a central axis centered on said shank, and said arcuate interior surface being centered on said axis and extending from said axis toward the periphery of the backing member throughout 360 degrees, terminating in a periphery which is supported by said peripheral flange, said fabric sheet and said disc-like central portion having means by which said shank is received, said shank having a first section adjacent to the head and a second section remote from the head and having a free end, said second section constituting a major portion of the length of the shank and having a taper in the direction away from said head, the length of said first section being less than about 2.5 to 3.0 times the diameter of said first section and that engagement of said free end with said arcuate interior surface, and continued relative axial movement of said shank and insert causes said second section to form a curl that constitutes a means for locking the tack immovably in assembled relation to the insert and shell, all without backing of said first section.

4,700,436

MAGNETIC FASTENER

Tamao Morita, 47-1, Arakawa 6-Chome, Arakawa-ku, Tokyo, Japan

Filed Mar. 5, 1986, Ser. No. 836,537
Claims priority, application Japan, Mar. 7, 1985, 60-45260; Mar. 25, 1985, 60-58597
Int. Cl.[4] A44B 21/00; E05C 17/56
U.S. Cl. 24—303 20 Claims



1. In a magnetic fastener including a permanent magnet member having first and second sides of opposite polarity, a first magnetic pole plate attached against the first side of the magnet member and a second magnetic pole plate removably attachable on the second side of the magnet member, the pole plates being magnetically attracted to the magnet member and to each other through the magnet member, the improvement wherein:

said permanent magnet member comprises a dispersion of hard magnetic powder in a matrix of synthetic resin; and

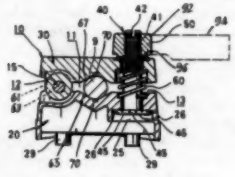
said first magnetic pole plate is integrally attached to said permanent magnet member by said permanent magnet member itself.

4,700,437

LEVER LOCK CLAMP

Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Dec. 30, 1986, Ser. No. 947,818
Claims priority, application Japan, Jul. 23, 1986, 61-113282[U]
Int. Cl.[4] F16B 39/282; B25B 5/08
U.S. Cl. 24—456 13 Claims



1. A clamp comprising first and second jaws which include

clamping surfaces that face each other; the jaws being pivotally attached for their clamping surfaces to pivot toward and away from one another around a pivot axis;

a threaded screw supported to the first jaw and extending to the second jaw in a direction transversely to the direction of the pivot axis;

a locking lever screw threadedly supported on the screw and engageable with the second jaw, such that rotation of the locking lever around the screw with the screw held to prohibit its rotation and with the locking lever engaging the second jaw, moves the locking lever against the second jaw for moving the second jaw selectively toward and away from the first jaw as the locking lever is respectively rotated in a first and second direction;

first engagement means on the first jaw and cooperating second engagement means on the screw, such that when the first and second engagement means are in engagement, the screw is prohibited from rotation by that engagement; the screw being shiftable axially with respect to the first jaw for separating the second engagement means from the first engagement means, thereby freeing the screw for rotation with respect to the first jaw, such that upon rotation of the screw with respect to the lever, the axial position of the lever along the screw is adjustable for adjusting the orientation of the lever with respect to the second jaw in any particular degree of separation of the clamping surfaces of the jaw; and the screw also being shiftable axially for engaging the first and second engagement means.

4,700,438

JEWELRY CLASP

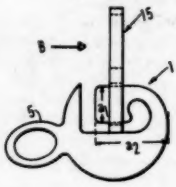
Pamela M. Randall, 46, St. John's Road, Driffield, Y025 7RS, Great Britain

Filed Mar. 8, 1985, Ser. No. 709,794

Claims priority, application United Kingdom, Mar. 10, 1984, 8406344

Int. Cl.[4] A44B *13/00*

U.S. Cl. 24—599 **9 Claims**



1. A jewelry clasp comprising a clasp member and a link member for engagement with said clasp member, said link member including an annular shaped body defining aperture means therein, at least a portion of the annular shaped body forming a bar between opposite sides of said annular shaped body having a cross-section defining a first dimension in a direction generally parallel to a plane of said aperture means and a second dimension, greater than the first dimension, in a direction generally perpendicular to the plane of said aperture means; said clasp member further including a generally plate shaped body defined between parallel first and second major outer surfaces having an elongate slot therein defining a plurality of differently inclined paths, including an entry path, at least one further path as a continuation of said entry path and a blind path as a continuation of said at least one further path; said paths being wide enough to accommodate said first dimension of said bar therein and enable said bar to be displaced along said entry path and said at least one further path and accommodated in said blind path, said at least one further path being of less width than said second dimension of said bar so that once accommodated in the said blind path said bar cannot be returned through said at least one further path unless said first dimension of said bar is aligned with said at least one further path; and, said aperture means defined by said annular shaped body having a dimension perpendicular to said bar which is marginally greater than the length of said entry path for enabling said bar to be displaced along said at least one further path with said first dimension substantially perpendicular to said at least one further path and for preventing substantial rotation of said link member from a substantially perpendicular attitude when said bar is being displaced along said at least one further path.

4,700,439

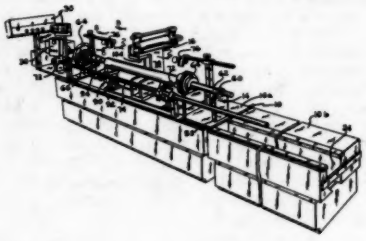
DRIVESHAFT FABRICATING APPARATUS

Gordon E. Hines, Ann Arbor, Mich., assignor to Hines Industries, Inc., Ann Arbor, Mich.

Filed Jul. 17, 1984, Ser. No. 631,579

Int. Cl.[4] B21D *7/12*

U.S. Cl. 29—33 T **21 Claims**



1. A driveshaft fabricating apparatus for finishing workpiece composed of a driveshaft tube and a driveshaft endpiece installed on such driveshaft tube comprising, in combination:

a first elongated bed member;

driving means for rotating such workpiece located proximate one end of said first bed member;

support means positioned on said first bed member for supporting such rotating workpiece;

longitudinally adjustable sensor means adjacent such rotating workpiece for sensing the presence and location of any radial misalignment along the longitudinal axis of such rotating workpiece; and,

press means including a second bed member positioned on said first bed member for longitudinal movement with respect to such workpiece and said first bed member, at least two workpiece support stanchions, each stanchion mounted on said second bed member for longitudinal movement with respect to such workpiece and a press assembly for applying a radially deflecting force to such workpiece to eliminate such radial misalignment, wherein said stanchions are positionable in close proximity to such area of radial misalignment and said stanchions and said second bed member absorb the forces applied to such workpiece during operation of said press assembly.

4,700,440

LC FILTER MANUFACTURING METHOD

Yukio Sakamoto, Fukui; Shinichi Madokoro, Nyuu, and Shingo Okuyama, Takefu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Mar. 5, 1986, Ser. No. 836,517

Claims priority, application Japan, Mar. 29, 1985, 60-67277

Int. Cl.[4] H01G *4/28*

U.S. Cl. 29—25.42 **7 Claims**

1. A manufacturing method for an LC filter having a cylindrical magnetic material member, a central conductor passing therethrough, and a cylindrical capacitor into which said mag-

netic material member is inserted, said manufacturing method comprising the steps of:

forming electrodes on the inside and the outside of a cylindrical dielectric member for forming said cylindrical capacitor;

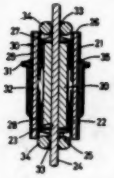
forming electrodes on at least the two end faces of said cylindrical magnetic material member;

passing said central conductor through said magnetic material member on which said electrodes are formed;

applying solder to said central conductor and said electrodes on said magnetic material member;

inserting said magnetic material member with said soldered electrodes and said central conductor into said cylindrical capacitor;

placing on said central conductor at each end of said magnetic material member a sealing member having a through hole of a diameter which is from about equal to that of said



central conductor to slightly smaller than that of said central conductor, and having an outer diameter which is from about equal to the inner diameter of said cylindrical capacitor to larger than the inner diameter of said cylindrical capacitor by inserting said central conductor through said through holes in said sealing members, and then moving said sealing members into sealing engagement with the respective ends of said cylindrical capacitor;

dipping said cylindrical capacitor on which said sealing members are mounted into molten solder for applying solder to said external electrode on said cylindrical capacitor, and remelting the solder applied to said electrodes on said magnetic material member and said central conductor by applying heat from the exterior of said cylindrical capacitor, thereby soldering said electrodes on said magnetic material member to said internal electrodes of said cylindrical capacitor.

4,700,441

TAPPING MACHINE

Hidekatsu Ikeda, Hatano; Hiroyuki Morikawa, Kanagawa, and Yasunori Yoshie, Yokohama, all of Japan, assignors to Amada Company, Limited, Japan

Filed Oct. 10, 1985, Ser. No. 786,066

Claims priority, application Japan, Oct. 12, 1984, 59-212571

Int. Cl.[4] B23P *23/04*

U.S. Cl. 29—33 P **12 Claims**

1. A tapping machine comprising:

upper and lower frames defining a throat section therebetween;

a workpiece transfer-and-positioning device for positioning a plate-shaped workpiece in the longitudinal and transverse directions within said throat section;

an upper tool support member secured to the forward edge of the upper frame;

a plurality of tapping units supported on said upper frame;

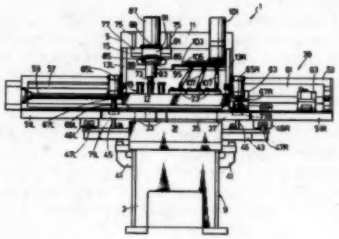
a plurality of punches disposed in the direction transverse to the longitudinal direction of the upper frame provided on said upper tool support member;

a plurality of unit mounting holes for said tapping units and a plurality of unit mounting holes for said punches being formed in said upper tool support member;

said tapping units being inserted as a unit in said plurality of holes for said tapping units and said punches being inserted in said plurality of holes for said punches;

a first operating means supported on said upper frame connected to said tapping units for providing an operating force for said tapping units;

a striker supported on the upper frame in a freely positionable manner above said punches for applying an operating force to each punch;



a second operating means supported on said upper frame connected to said striker for providing an operating force to said striker for applying the operating force to each punch; and

a plurality of dies each mounted on the front edge of the lower frame in correspondence with each of the punches.

4,700,442

TOOL CHANGING APPARATUS FOR A MACHINE TOOL

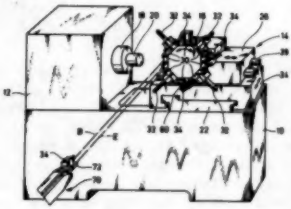
Heinrich Lahm, Neuhausen/Filder, Fed. Rep. of Germany, assignor to Index-Werke Komm.-Ges. Hahn & Tessky, Esslingen, Fed. Rep. of Germany

Filed May 23, 1986, Ser. No. 867,796

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1985, 3519754

Int. Cl.[4] B23B *29/24*

U.S. Cl. 29—39 **8 Claims**



1. A tool changing apparatus for a machine tool comprising a working space and an indexable tool carrier (16) located adjacent said working space and having a plurality of tool receiving means (30) forming a row, at least a number of said tool receiving means having a holding means (42) for sliding and clamping a base (40) of a tool onto the respective tool receiving means, at least one of said bases carrying an inside diameter working tool (32) having a tool axis, said holding means being provided with a clamping device (52) and adapted to be brought into a tool-changing position, as well as a clamping element (64) for tightening and releasing said clamping device, said clamping element having an axis, and with a tool gripping device (70) including an actuating device (110) adapted to be coupled in a coupling direction to the clamping element, means for displacing the tool gripping device (70) along a transfer path (E) towards a tool holding means located

in tool-changing position in a direction of displacement being transverse to the row formed by said tool receiving means and transverse to the tool axis of an inside diameter working tool (32) located in tool-changing position as well as at least approximately parallel to the axis of said clamping element (64) of the tool holding means (42) located in tool-changing position, said coupling direction extending parallel to said direction of displacement of the tool gripping device, the improvement comprising:

(a) the slide-on direction (B) of a tool base (40) towards a tool holding means (42) located in tool-changing position extends transversely to the tool axis of an inside diameter working tool (32) located in tool-changing position and parallel to the direction of displacement of said tool gripping device (70);

(b) the tool gripping device (70) has mounting means (74) on which tool gripping elements (94) for holding a tool are movably mounted, and

(c) the tool gripping device (70) comprises a common drive means (76) for moving said tool gripping elements (94) and for driving said clamping elements actuating device (110).

4,700,443

METHOD FOR THE ASSEMBLY OF AN INNER RACE FOR A ROLLER BEARING AND AN ANNULAR CAGE WHOSE OPENINGS CONTAIN ROLLING ELEMENTS

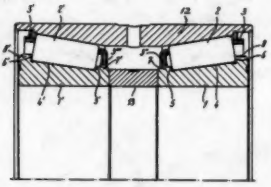
Bart Schalk, Zeist, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed Jul. 1, 1985, Ser. No. 750,916

Claims priority, application Netherlands, Jul. 2, 1984, 8402100

Int. Cl.[4] B21D *53/12;* **B21K** *1/04, 1/05*

U.S. Cl. 29—148.4 C **5 Claims**



1. Method for the assembly of an inner race for a roller bearing and an annular cage with rolling elements contained in openings in this cage separated by ridges, said inner race being placed essentially concentrically within the cage with the rolling elements retained by the cage contained in a track fashioned in the outer circumferential surface of the inner race, said track being bordered on both sides by shoulders formed by opposite lateral surfaces of radially revolving flanges at, respectively, the inner and outer top surfaces of the inner race, which track is tapered from the outside toward the inside with regard to the cardioid line of the inner race, and the rolling elements are formed by basically cylindrical elements whose circumferential surfaces are slightly tapered from the outside toward the inside, a revolving end plane of the inner flange with regard to the cardioid line of the ring, is tapered from the inside toward the outside of the flange, comprising the steps;

(a) inserting said rolling elements into said cage openings;

(b) supporting said cage containing said rolling elements with the narrow diameter end of said cage on a bearing plane which is formed with an annular groove of diameter and width corresponding to the inside narrower end of said inner race,

(c) aligning said inner race with said cage,

(d) pressing said inner race into said cage, said race entering from the outer, larger diameter end of said cage,

(e) continue pressing until the inner end of said race is contained in said annular groove in said bearing surface and said rolling elements seat on said track,

and comprising the further step preceding step (a) of forming the sides of said ridges bordering the openings in the cage to have a slightly convex shape in the direciton of the openings, said openings being narrowed, as viewed in a plan view, by said convex shape.

4,700,444

METHOD FOR MAKING A COMPOSITE ENGINE CYLINDER BLOCK WITH PREFORMED LINER

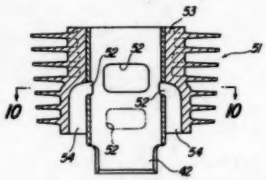
Hiroshi Yamagata, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 704,535, Feb. 25, 1985, Pat. No. 4,637,110. This application Dec. 11, 1985, Ser. No. 807,534

Claims priority, application Japan, Dec. 14, 1984, 59-262822; Dec. 21, 1984, 59-268452; Dec. 21, 1984, 59-268453

Int. Cl.[4] B23P *15/00;* **B22D** *19/00*

U.S. Cl. 29—156.4 WL **6 Claims**



1. The method of making a composite cylinder block for an internal combustion engine or the like comprising forming a cylinder liner from a cylinder pipe section, forming at least one port opening in the formed cylinder liner by punching said opening from the inner diameter of said cylindrical pipe section to its outer diameter, and casting at least in part around said cylinder liner a cylindrical block formed from a different material from said cylinder liner.

4,700,445

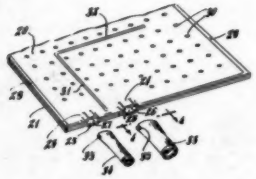
METHOD OF MANUFACTURING HEAT TRANSFER PANELS BY INFLATION

Rubin Raskin, 127 Remsen St., Brooklyn, N.Y. 11201

Filed Jul. 12, 1982, Ser. No. 397,571

Int. Cl.[4] B21D *53/02*

U.S. Cl. 29—157.3 V **4 Claims**



1. In the method of forming heat exchange panels in which a fluid heat exchange medium is circulated in flow passages between an inlet coupling and an outlet coupling, both of which are adapted for connection to respective supply pipes, said panel being formed by welding together two facially opposed deformable metal sheets constituting a front sheet and a back sheet, respectively, at least the front sheet being providing with pattern of welded and non-welded areas outlining said flow passages, in which method a fluid high pressure medium is injected between said sheets while they are restrained in position, to expand said non-welded areas to form said flow passages, the improvement comprising the steps of:

(a) forming an inlet opening and an outlet opening for said fluid media by embossing walled depressions to serve as inlet opening and outlet openings, respectively in said front sheet in an area where it is welded to said back sheet;
(b) making openings in the walls of said depressions to establish communication with said flow passages;
(c) applying a pattern of welded and non-welded areas to at least one of said sheets to define flow passages therebetween for said fluid media;
(d) fitting a coupling over said inlet and outlet openings for connection to asid supply pipes;
(e) admitting high pressure medium through one of said couplings at a volumetric pressure calculatled to expand said non-welded areas into said flow passages while maintaining the other one of said couplings sealed; and
(f) unsealing the other one of said couplings upon completion of the expansion step.

4,700,446

FORGING PROCESS

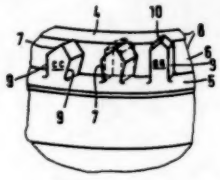
Anton Schmid; Georg Tauschek, both of Munich; Andreas Sedlmeier, Ummendorf, and Peter Pollok, Munich, all of Fed. Rep. of Germany, assignors to Bayerisches Leichtmetallwerk Graf Blucher von Wahlstatt GmbH, Munich, Fed. Rep. of Germany

PCT No. PCT/EP85/00335, § 371 Date Mar. 20, 1986, § 102(e) Date Mar. 20, 1986, PCT Pub. No. WO86/00838, PCT Pub. Date Feb. 13, 1986

PCT Filed Jul. 8, 1985, Ser. No. 857,744

Int. Cl.[4] B21K *1/30*

U.S. Cl. 29—159.2 **4 Claims**



1. Process for manufacture of a finished synchronizing component for shift transmissions from a semi-finished synchronizing component, having a short toothing, formed by preliminary forging, said short toothing comprising undercut teeth, the radially inner sides of which lie against a common cylindrical surface which extends between upper and lower planar surfaces, the lower planar surface extending outwardly from a lower end of the cylindrical surface in perpendicular relation thereto, an upper end of the cylindrical surface terminating flush with the upper planar surface, said teeth of said semi-finished synchronizing component having a base portion on said lower planar surface and additionally having parallel tooth flanks and a height exceeding that of the teeth of said finished synchronizing component, subjecting the tooth heads to a preliminary clenching during which material compression of a semi-finished component takes place, cold compacting the base region of the teeth on the lower planar surface to round out said teeth flanks at their bases, and subjecting the tooth heads to final clenching to impart a roof shape to the heads of said teeth and an obliqueness to the teeth flanks corresponding to their undercuts.

4,700,447

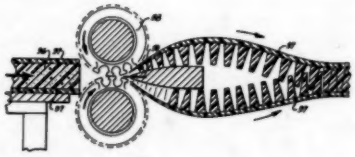
SUPPORT PAD AND METHOD OF MANUFACTURE

Donald C. Spann, Greenville, S.C., assignor to Span America Medical Systems, Inc., Greenville, S.C.

Division of Ser. No. 530,519, Sep. 9, 1983, Pat. No. 4,603,445. This application Mar. 13, 1986, Ser. No. 839,337

Int. Cl.[4] B23P *17/00;* **A47C** *27/14;* **B29C** *49/00*

U.S. Cl. 29—418 **16 Claims**



1. The method of making a foam pad, comprising the steps of:

feeding at least one foam pad blank separably together with at least one compressible auxiliary blank into a convoluter machine having rolls with spaced projections thereon compressing discrete areas of said foam and compressible blanks, said foam blank and said compressible blank being in stacked relation when passing between the rolls of the convoluter machine; and

sawing said foam blank while in a compressed state emerging from such rolls to thereby form a plurality of promontories on said foam blank having flat apex portions.

4,700,448

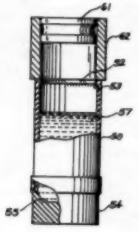
PROCESS FOR THE MANUFACTURE OF A STICK PUSH-UP DEVICE

Thomas J. Parker, Fayetteville, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 180,282, Aug. 22, 1980, abandoned, which is a continuation of Ser. No. 960,523, Nov. 14, 1978, abandoned. This application Feb. 18, 1982, Ser. No. 349,880

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—434 **4 Claims**



1. A process for the manufacture of a solid, wax-like cosmetic or pharmaceutical stick product, which comprises the steps of attaching a pouring cap closure to the upper portion of a suitable container for raid stick, said container being open at the bottom; inverting said container body and filling from the bottom thereof with a premeasured quantity of said cosmetic or pharmaceutical composition in a molten state; cooling said composition to form within said container a solid, wax-like stick, while maintaining the upper surface molten, inserting into the bottom portion of said container body, a push-up device, said push-up device having means for escape of air within said container, without passing through the base thereof and without extrusion of molten composition through the base thereof , seating said push-up device against said molten sur-

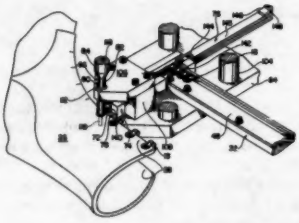
face, solidifying said molten surface, re-inverting the container and removing said pouring cap; and affixing a cap to said container.

4,700,449

APPARATUS FOR ASSEMBLING SPEED LACERS

Wayne M. Chapman, West Greenwich, R.I., assignor to Rau Fasteners Inc., Providence, R.I.

Filed Jan. 14, 1986, Ser. No. 819,108
Int. Cl.[4] A41H *37/02*
U.S. Cl. 29—513 10 Claims



1. A method of assembling a speed lacer on a sheet prior to the assembly of a rivet in said speed lacer, wherein the speed lacer is of generally U-shaped configuration and comprises an arch-shaped end portion and a pair of spaced legs which extend therefrom terminating in spaced, substantially parrallel apertured clamping discs, said method comprising:

a. positioning said speed lacer in a predetermined orientation on said sheet;

b. moving said speed lacer to a clamping position wherein the clamping discs thereof are in clamping engagement with said sheet by engaging said clamping discs with a pair of dies to deform said speed lacer to said clamping position;

c. punching an aperture in said sheet with a punch while said dies are still in engagement with said clamping discs, said punch being operative through one of said dies, said aperture being aligned with the apertures in said clamping discs; and

d. removing said dies and said punch from said speed lacer and said sheet.

3. An apparatus for assembling a speed lacer on a sheet, wherein the speed lacer is of generally U-shaped configuration and comprises an arch-shaped end portion and a pair of spaced legs which extend therefrom terminating in spaced, substantially parallel, apertured clamping discs, said apparatus comprising:

a. means engageable with the arch-shaped end portion of a speed lacer for receiving and positioning the speed lacer in an aligned position at a work station;

b. first and second die means engageable with the clamping discs of said speed lacer when said speed lacer is in said aligned position for urging said clamping discs together to deform said speed lacer to a clamping position wherein when said sheet is received between said clamping discs, said clamping discs clampingly engage opposite sides thereof; and

c. punch means operative through said first die means when said first and second die means are in engagement with said clamping discs and said clamping discs are in said clamping position on said sheet for punching an aperture in said sheet which is aligned with the apertures in said discs.

4,700,450

PREPARATION AND RENOVATION OF A FUSION ROLLER FOR A XEROGRAPHIC MACHINE, FUSION ROLLER AND VULCANIZABLE COMPOSITION

Lucien P. Michel, Neuilly Sur Seine, France, assignor to Ateliers de Conceptions et d'Innovations Industrielles, Courbevoie, France

Filed Feb. 11, 1986, Ser. No. 828,282
Claims priority, application France, Feb. 12, 1985, 85 01956
Int. Cl.[4] B23P *17/00;* C08K *3/22*
U.S. Cl. 29—527.2 11 Claims

1. A method of preparation of an external cover of a fusion roller for a xerographic machine, said cover being constituted by a homogeneous layer covering a hollow core receiving heating means, said method comprising the stages of:

(a) cold kneading a mixture having, for 100 parts of a rubber of a fluorine-containing elastomer, 55 to 60 parts of carbon black, 2 to 6 parts of magnesium oxide, 4 to 8 parts of calcium hydroxide and 0 to 2 parts of polyethylene wax,

(b) forming said mixture by extrusion or calendering into a cover material,

(c) application of said cover material in a homogeneous layer to the surface of said core of said roller,

(d) vulcanisation at elevated temperature and under pressure of said cover material thus applied onto said core,

(e) dressing of said cover to a constant thickness.

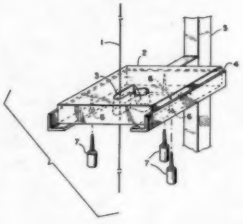
11. A vulcanizable composition for a covering material for a fusion roller for a xerographic machine, said vulcanizable composition formed of a mixture having, for 100 parts of rubber of a fluorine-containing elastomer, 55 to 60 parts of carbon black, 2 to 6 parts of magnesium oxide, 4 to 8 parts of calcium hydroxide and ½ to 2 parts of polyethylene wax.

4,700,451

METHOD FOR AUTOMATICALLY INDEXING CAST FIELD SHAPING BLOCKS TO A RADIATION THERAPY TREATMENT TRAY AND A COOLING TRAY FOR CAST BLOCKS

William T. Clark, III, 13 Park La., Folsom, La. 70437

Division of Ser. No. 658,434, Oct. 5, 1984, abandoned. This application May 14, 1986, Ser. No. 862,969
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—527.5 5 Claims



1. A method of indexing a field shaping block to a treatment tray used in a radiation therapy treatment machine, which machine has a radiation source and means for supporting a patient positioned for treatment in line with said source, cutting in a polyfoam block a cavity by cutting apparatus which has a phantom radiation source and a patient X-ray film positioned in line with said phantom source, casting on said cavity a metal field shaping block, indexing said polyfoam block containing the cast metal field shaping block to the treatment tray of the radiation therapy treatment machine and positioning the patient identically to the indexation of said polyfoam block to a block support in said cutting apparatus with respect to the phantom radiation source and patient X-ray film.

4,700,452

TOOL MAGAZINE

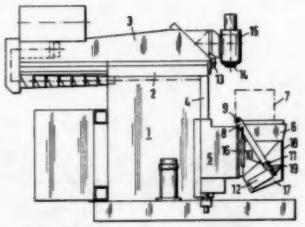
Werner Babel, Pfronten-Meilingen, Fed. Rep. of Germany, assignor to MAHO Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,607

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1984, 3447706; European Pat. Off., Apr. 3, 1985, 85104015.4

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 10 Claims



1. A tool magazine, more particularly for milling and drilling machines having a movble work table, comprising at least one swing arm having a first and second ends, first means for attaching a said first end of a said swing arm to the work table for swinging motion about a first horizontal axis, a straight tool carrier which has a row of tool holding fixtures, and second means for pivotally attaching the tool carrier to the second end of said at least one swing arm for motion about a second axis parallel to the first axis so that by motion of said at least one arm and of said tool carrier about said first and second axes, respectively, a tool holding fixture is positioned for changing a tool of a spindle above said table, said tool carrier being movable into a home position in a closable box which is arranged under a front end wall of the work table.

4,700,453

TURNING MACHINE

Hans Strate, Hanover, and Hans-Dieter Simon, Laatzen, both of Fed. Rep. of Germany, assignors to H. Wohlenberg KG GmbH & Co., Hanover, Fed. Rep. of Germany

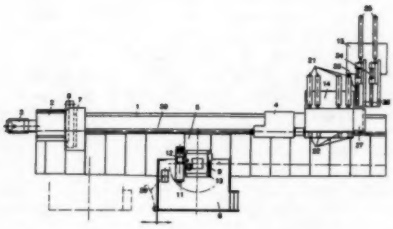
PCT No. PCT/DE85/00084, § 371 Date Nov. 12, 1985, § 102(e) Date Nov. 12, 1985, PCT Pub. No. WO85/04126, PCT Pub. Date Sep. 26, 1985

PCT Filed Mar. 14, 1985, Ser. No. 800,595

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3410276014

Int. Cl.[4] B23Q *3/155*

U.S. Cl. 29—568 16 Claims



1. A lathe (turning machine) having a bench, a headstock, a driving arrangement for a workpiece holding fixture associated with the headstock, a tailstock, and a tool post movable along the bench, and characterized by the fact that the tool post (5) is provided with a processing turret (9) which is rotatable around a vertical axis (10) and securable at various angles, and by the fact that the processing turret is equipped with a drivable spindle unit (11) equipped with tool holding fixtures (32, 33) at both of its ends, and with at least one holding fixture (13) for temporary attachment of tools or machining units (17–20); said spindle unit being movably mounted on the processing turret so that its height is adjustable and being provided with a digital control means for said height adjustment.

4,700,454

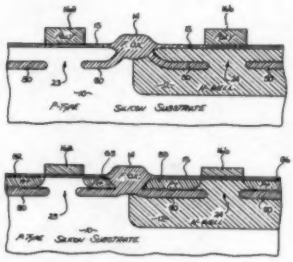
PROCESS FOR FORMING MOS TRANSISTOR WITH BURIED OXIDE REGIONS FOR INSULATION

William Baerg, Palo Alto; Chiu H. Ting, Saratoga; Byron B. Siu, and J. C. Tzeng, both of Sunnyvale, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Nov. 4, 1985, Ser. No. 794,524

Int. Cl.[4] H01L *21/265, 21/16, 21/28, 21/316*

U.S. Cl. 437—24 12 Claims



11. A process for forming transistors on a silicon substrate comprising the steps of:

forming an insulative layer on said substrate;

forming a polysilicon layer over said insulative layer;

defining a plurality of masking means over said polsilicon layer;

forming a plurality of gate members from said polysilicon layer in alignment with said masking members;

subjecting said substrate to ion implantation of an ion which combines with said silicon to form an insulative region beneath the surface of said silicon substrate, said gate members being sufficiently thick to block said ions from completely penetrating said polysilicon gate members;

connecting said substrate to form a buried insulative region in said substrate from said ions and said silicon, said insulative region including openings formed in alignment with said gate members;

forming source and drain regions in said substrate in alignment with said gate members;

removing said masking members;

removing those portions of said gate members that have been implanted with said ions;

whereby transistors are formed in said substrate.

4,700,455

METHOD OF FABRICATING SCHOTTKY GATE-TYPE GAAS FIELD EFFECT TRANSISTOR

Kizashi Shimada, Yokohama; Tatsuo Akiyama, Tokyo, and Yutaka Koshino, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 30, 1985, Ser. No. 792,825

Claims priority, application Japan, Nov. 1, 1984, 59-229004

Int. Cl.[4] H01L *21/265*

U.S. Cl. 437—39 7 Claims

1. A method of manufacturing a semiconductor device, comprising the steps of:

forming a first impurity region of one conductive type in a compound semiconductor substrate;

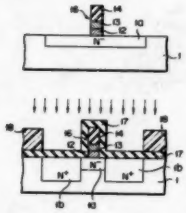
forming a metal film and a first insulating film made of silicon dioxide sequentially on a surface of said first impurity region;

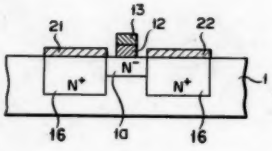
selectively etching said metal film and said first insulating film in the same pattern and forming at a substantially central portion of said first impurity region of first electrode consisting of a metal pattern, an upper surface of which is covered with a first insulating film pattern;

forming a second insulating film made of silicon dioxide on an entire surface of said compound semiconductor substrate;

forming a resist pattern having openings at two sides of said first electrode on said second insulating film;

ion-implanting an impurity of one couductive type in said substrate through said second insulating film exposed in said openings by using as a mask said first electrode, a





portion of said second insulating film formed on side walls of said first electrode and said resist pattern in order to form second and third impurity regions of higher impurity concentrations than that of said first impurity region, and leaving a portion of said first impurity region between said second and third impurity regions and immediately under said first electrode and portions of said second insulating film on the side walls of said first electrode;

removing said second insulating film by performing anisotropic etching on said entire surface of said compound semiconductor substrate and leaving siad second insulating film on the side walls of said first electrode;

forming an ohmic metal film on said entire surface of said compound semiconductor substrate; and

removing said resist pattern together with a portion of said ohmic metal film thereon so as to form self-aligned second and third electrodes on said second and third impurity regions, respectively.

4,700,456

SEMICONDUCTOR DEVICE CONTAINING BIPOLAR TRANSISTOR FORMED BY METHOD INCLUDING THREE PHOTOLITHOGRAPHIC STEPS

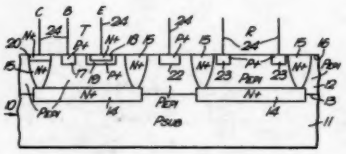
Jeffrey A. Bruchez, Stockport, England, assignor to Ferranti, plc, Cheadle, England

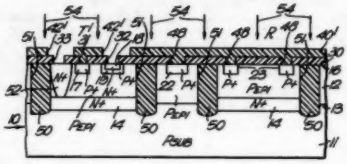
Filed Oct. 23, 1985, Ser. No. 790,607

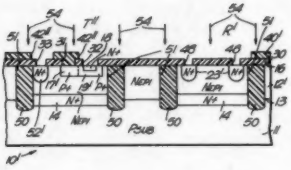
Claims priority, application United Kingdom, Oct. 24, 1984, 8426897

Int. Cl.[4] H01L *29/72, 21/473, 21/74*

U.S. Cl. 439—54 **5 Claims**







1. A method of fabricating a semiconductor device in a semiconductor body, the semiconductor body comprising a substrate of one conductivity type, and an epitaxial layer of said one conductivity type thereon, with an interface therebetween, and the epitaxial layer having a surface remote from the substrate, the device including a bipolar transistor having a collector of the opposite conductivity type the collector comprising a buried, heavily doped, layer at a part of the interface between the substrate and the epitaxial layer, and an isolation barrier, extending through the epitaxial layer to contact the buried, heavily doped, layer, the isolation barrier and the buried layer, together, isolating the bipolar transistor within the semiconductor body, and the isolation barrier also comprising the collector contact region, having a heavily doped surface portion therefor, the bipolar transistor also having a base, and a heavily doped emitter, the base comprising an unmodified portion of the epitaxial layer, a heavily doped region surrounding within the semiconductor body, and being contiguous with, the emitter, and a heavily doped base contact region spaced from the collector contact region, the method including a part wherein there are formed, by modifying selected portions of the semiconductor body, the emitter, the heavily doped base region surrounding the emitter, and the heavily doped base and collector contact regions, said method part including providing on the surface of the epitaxial layer remote

from the substrate an initial, and a subsequent, initially continuous, layer of a first resist material, and an initially continuous layer of a second resist material, each provided layer of resist material being capable of acting as a barrier for conductivity type determining impurity, the second resist material being capable of being attacked by an etchant relatively inactive with the first resist material, and the first resist material comprising passivating material for the completed device, said method part also including a sequence of only three photolithographic process steps, in said method part there being provided the initial, initially continuous, layer of first resist material on the epitaxial layer, in the first photolithographic process step of the sequence forming an aperture therein to expose selectively at least part of the body portion to become the collector contact region, introducing a conductivity type determining impurity characteristic of said opposite conductivity type into the semiconductor body through the sole aperture in the initial layer of first resist material, then there being provided the subsequent, initially continuous, layer of first resist material on the epitaxial layer, in the second photolithographic process step of the sequence, forming three apertures in the subsequent layer of first resist material, to expose selectively at least part of each of the body portions to become the emitter and the two contact regions, introducing a conductivity type determining impurity characteristic of said one conductivity type into the semiconductor body through the three apertures in the subsequent layer of first resist material, providing the sole initially continuous layer of second resist material on the so apertured, subsequent, layer of first resist material, in the coarse, third photolithographic process step of the sequence, parts of the layer of second resist material are removed selectively, to expose, selectively, at least part of the body portions to become the emitter and the collector contact region, and introducing a conductivity type determining impurity characteristic of said opposite conductivity type into the semiconductor body through the exposed two apertures in the subsequent layer of first resist material.

4,700,457

METHOD OF MAKING MULTILAYER CAPACITOR MEMORY DEVICE

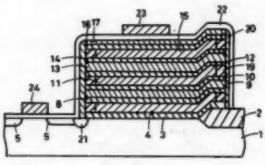
Takayuki Matsukawa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1986, Ser. No. 823,100

Claims priority, application Japan, Mar. 29, 1985, 60-68155

Int. Cl.[4] H01L *21/72*

U.S. Cl. 437—52 **6 Claims**



1. A method of manufacturing of a capacitor included in a semiconductor device formed on a semiconductor substrate, comprising the steps of:

forming multiple layered film over the whole surface of said semiconductor substrate by placing alternately first conductive layer and second conductive layer of different etching characteristics with dielectric film therebetween,

applying an anisotropic etching process to said multiple layered film formed by said first step so that said multiple layered film remain only in predetermined regions with all the side faces of said multiple layered film being exposed,

etching all the side faces of said multiple layered film exposed by said second mentioned step using an etching process preferentially acting on said first conductive layers so that the side faces of said first conductive layers are recessed inward with the side faces of said second conductive layers being kept unchanged,

filling the gaps made by said recession of said first conductive layers with an insulating material, and

electrically interconnecting said second conductive layers having the exposed side faces by using a conductor.

4,700,458

METHOD OF MANUFACTURE THIN FILM TRANSISTOR

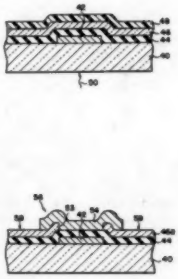
Kouji Suzuki; Mitsushi Ikeda, both of Yokohama, and Toshio Aoki, Hiratsuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 400,357, Jul. 21, 1982, abandoned. This application Sep. 24, 1985, Ser. No. 779,648

Claims priority, application Japan, Jul. 27, 1981, 56-117423; Mar. 31, 1982, 57-51421

Int. Cl.[4] H01L *21/312*

U.S. Cl. 437—83 **16 Claims**



1. A method for manufacturing a thin-film transistor with a gate layer, and source and drain electrode layers, said method comprising the steps of:

forming a metal film having a predetermined profile on a first surface of an electrically insulative substrate which permits radiation to be transmitted therethrough, said metal film preventing the transmission of radiation and serving as the gate layer;

forming an electrically insulative film on the first surface of said substrate so as to cover the gate metal film, said insulative film being thin enough to allow the transmittance of radiation;

forming an electrically conductive and transparent film on said insulative film;

forming a negative photoresist film on said conductive film;

irradiating radiation from a second surface side opposite the first surface of said substrate to expose said negative photoresist film with said gate metal film being directly used as a mask, thereby forming a shadow of said gate metal film on said negative photoresist film, and then performing an etching process to obtain an electrically conductive film pattern in which an opening, which coincides with said profile of said gate metal film, is formed to define the source and drain electrode layers which are prevented from overlapping said gate metal film and which are self-aligned with said gate metal film; and

forming a first semiconductive film on said opening and partially overlapping said source and drain electrode layers, said first semiconductive film serving as a channel region of said transistor.

4,700,459

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH OVERLAPPING STRIP ELECTRODES

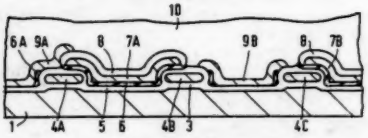
Hermanus L. Peek, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 8, 1986, Ser. No. 905,225

Claims priority, application Netherlands, Sep. 11, 1985, 8502478

Int. Cl.[4] H01L 27/00, 31/00, 29/78

U.S. Cl. 437—53 6 Claims



1. A method of manufacturing a semiconductor device with mutually insulated strip-shaped silicon electrodes overlapping each other, said method comprising the steps of

a. providing on a silicon region an electrically insulating layer of a first oxide having a homogeneous thickness,

b. forming a first silicon layer on said insulating layer,

c. patterning said first silicon layer in a plurality of strip-shaped first electrodes by etching,

d. removing exposed parts of said insulating layer,

e. forming a second oxide layer on said first electrodes and on exposed parts of said silicon region by a first thermal oxidation,

f. covering the entire surface with an electrically insulating anti-oxidation layer, said first oxide layer having an overall dielectric thickness substantially equal to the thickness of a combined second oxide layer and said anti-oxidation layer,

g. depositing a second silicon layer,

h. patterning said second silicon layer in a plurality of strip-shaped second electrodes by etching, wherein each second electrode is located in alternate spaces between the said first electrodes, said second electrodes partially overlapping said first electrodes between, and partially overlapping, alternate pairs of said first electrodes,

i. forming a third oxide layer on said second electrodes by thermal oxidation,

j. removing by anisotropic plasma etching exposed parts of said anti-oxidation layer and exposed parts of said second and third oxide layers except for parts of said anti-oxidation layer located (1) on oxidized edges of said first electrodes, and (2) under projecting parts of said second and third oxide layers,

k. carrying out a third thermal oxidation to increase the dielectric thickness of exposed parts of said second oxide layer to practically the same value as the dielectric thickness under said first and second electrodes,

l. providing a third silicon layer, and

m. patterning said third silicon layer in a plurality of strip-shaped third electrodes, each third electrode being located between, and partially overlapping, two first electrodes, and wherein at least one third electrode also overlaps a second electrode.

4,700,460

METHOD FOR FABRICATING BIDIRECTIONAL VERTICAL POWER MOS DEVICE

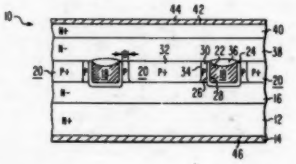
Gary M. Dolny, Middletown Township, Bucks County, Pa., and Lawrence A. Goodman, Plainsboro, N.J., assignors to RCA Corporation, Princeton, N.J.

Division of Ser. No. 868,633, May 30, 1986, Pat. No. 4,641,164.

This application Oct. 30, 1986, Ser. No. 924,865

Int. Cl.[4] H01L 21/74, 21/78, 21/80

U.S. Cl. 437—81 7 Claims



1. A method for fabricating a vertical power MOSFET comprising the steps of:

(a) providing a relatively heavily doped substrate of first conductivity type;

(b) forming a relatively lightly doped first conductivity type first epitaxial layer thereon;

(c) forming a second epitaxial layer of second conductivity type on the first epitaxial layer, the second layer having an aperture extending therethrough so as to expose a portion of the first epitaxial layer;

(d) thermally oxidizing the area exposed within the aperture so as to form a gate oxide layer on the second epitaxial layer and on the exposed portion of the first epitaxial layer;

(e) depositing polycrystalline silicon on the gate oxide layer so as to substantially fill each aperture;

(f) relatively heavily doping the polycrystalline silicon;

(g) relatively heavily doping that portion of the second epitaxial layer which is not adjacent to the gate oxide with second conductivity type dopant;

(h) forming an additional insulator layer on the surface of the polycrystalline silicon within each aperture;

(i) forming a relatively lightly doped third epitaxial layer, of first conductivity type, across the surface of the second epitaxial layer and the filled apertures therein;

(j) forming a relatively heavily doped layer, of first conductivity type, on the third epitaxial layer; and

(k) forming source and drain electrode contacts to the relatively heavily doped substrate and fourth layer.

4,700,461

PROCESS FOR MAKING JUNCTION FIELD-EFFECT TRANSISTORS

Hong-Kyun Choi, Concord, and Bor-Yeu Tsaur, Bedford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 29, 1986, Ser. No. 913,418

Int. Cl.[4] H01L 21/325, 21/425

U.S. Cl. 437—41 21 Claims

1. A method of forming a junction field-effect transistor on a substrate comprising the steps of:

(a) forming an island of silicon on, or in, said substrate;

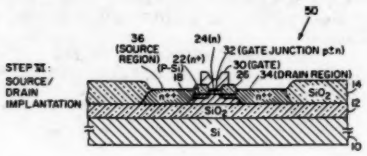
(b) doping said island with one type of conductivity dopant;

(c) forming two closely spaced regions of opposite conductivity in said island extending to an upper surface of said island;

(d) forming oxide extension regions over said opposite conductivity regions;

(e) forming opposite conductivity regions on either side of said oxide extension regions and between said regions;

(f) forming a silicon gate region of said one type conductivity over said oxide extension regions, and the opposite conductivity region therebetween, to form a shallow p-n junction adjacent the interface between the silicon gate



region and the underlying region between the oxide extensions; and

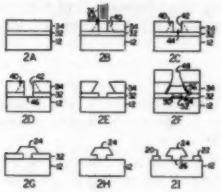
(g) forming source and drain regions of opposite conductivity at either side of the gate region using the oxide extension regions and gate region as a mask.

4,700,462

PROCESS FOR MAKING A T-GATED TRANSISTOR

Randall S. Beaubien, Westlake Village, and Lorri A. Erps, Pleasanton, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 8, 1986, Ser. No. 916,592
Int. Cl.⁴ H01L *21/285*
U.S. Cl. 437—187 **10 Claims**



1. A process for preparing a T-gate metal structure for use in a semiconductor device, the T-gate having a foot in contact with a semiconductor substrate and an enlarged head upon the foot and integral therewith, comprising the steps of:

furnishing a semiconductor substrate;

depositing a dielectric layer overlying the substrate;

depositing an electron beam positive resist layer overlying the dielectric layer;

exposing a linear pattern into the resist layer with a focused electron beam, the linear pattern having a central highly exposed region and a peripheral lesser exposed region;

developing a line profile in the resist layer corresponding to the highly exposed region, by removing a portion of the resist layer lying in the highly exposed region of the electron beam;

transferring the line profile to the dielectric layer by a dry etching process, by removing a portion of the dielectric layer lying under the line profile in the resist layer, the transferred line profile being the profile of the foot of the T-gate;

developing a head profile in the resist layer, by removing a portion of the resist layer lying in the peripheral lesser exposed region;

depositing a metal layer overlying the resist layer, thereby depositing metal into the foot profile and the head profile; and

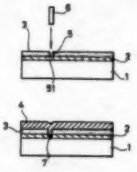
removing the resist layer, thereby also removing the portion of the metal layer not within the foot profile and the head profile.

4,700,463

NON-CRYSTALLINE SEMICONDUCTOR SOLAR BATTERY AND METHOD OF MANUFACTURE THEREOF

Toshio Hama, Kawasaki, Japan, assignor to Fuji Electric Company Ltd., Japan

Filed Sep. 4, 1986, Ser. No. 903,453
Claims priority, application Japan, Sep. 9, 1985, 60-199114
Int. Cl.⁴ H01L *31/18*
U.S. Cl. 437—2 **12 Claims**



1. A method of manufacturing a non-crystalline semiconductor solar battery, comprising:

(a) forming a transparent conductive film on an insulating transparent substrate, said transparent conductive film defining a first electrode;

(b) forming a non-crystalline semiconductor film on said transparent conductive film;

(c) detecting pinholes existing in said non-crystalline semiconductor film;

(d) applying a laser beam in a reducing atmosphere through pinholes detected in step (c) to portions of said transparent conductive film located at positions of said pinholes such that said portions of said transparent conductive film are caused to have a high resistance by reduction, and

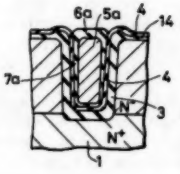
(e) forming a metal film on said non-crystalline semiconductor film, said metal film defining a second electrode.

4,700,464

METHOD OF FORMING TRENCH ISOLATION IN AN INTEGRATED CIRCUIT

Daisuke Okada; Akihisa Uchida; Toshihiko Takakura; Shinji Nakashima, all of Koganei; Nobuhiko Ohno, Tokorozawa, and Katsumi Ogiue, Hinode, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed Oct. 15, 1984, Ser. No. 661,116
Claims priority, application Japan, Oct. 14, 1983, 58-190779
Int. Cl.⁴ H01L *21/22, 21/302*
U.S. Cl. 437—67 **20 Claims**



1. A process for forming isolation regions in a semiconductor body, comprising steps of:

(a) forming grooves in a main surface of the semiconductor body;

(b) forming an initial silicon dioxide film at least on the surfaces of said semiconductor body exposed within the grooves;

(c) forming a silicon nitride film at least on the surfaces of the

initial silicon dioxide film formed on the surfaces of said semiconductor body exposed within said grooves;

(d) forming a first insulating film at least on said silicon nitride film in said grooves;

(e) filling said grooves with a material that is at least semiconducting; and

(f) forming a second insulating film so as to cover the surface of said material that is at least semiconducting, to thereby form said isolation regions.

4,700,465

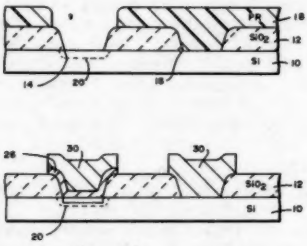
METHOD OF SELECTIVELY MAKING CONTACT STRUCTURES BOTH WITH BARRIER METAL AND WITHOUT BARRIER METAL IN A SINGLE PROCESS FLOW

Eric R. Sirkin, Mountain View, Calif., assignor to Zoran Corporation, Santa Clara, Calif.

Division of Ser. No. 574,364, Jan. 27, 1984, abandoned. This application Feb. 25, 1986, Ser. No. 833,216

Int. Cl.[4] H01L *21/425, 29/62*

U.S. Cl. 437—20 **3 Claims**



1. A method of fabricating an interconnection for a semiconductor structure including a semiconductor body having a major surface with a plurality of contact regions in said body and abutting said surface, said method comprising the steps of

providing a semiconductor body having a major surface,

forming an insulative layer over said major surface,

forming a plurality of openings through said insulative layer thereby exposing areas of said surface,

selectively forming a first layer of photo resist material over said insulative layer and exposing selected contact regions,

implanting ions in said selected contact regions,

removing said first layer of photo resist material,

forming a first layer of conductive material over said insulative layer and said contact regions,

selectively forming a second layer of photo resist material on said first layer of conductive material over said selected contact regions,

removing exposed portions of said first layer of conductive material, and

forming a second layer of conductive material over said insulative layer in contact with said first layer of conductive material over said selected contact regions and in contact with said major surface over other contact regions.

4,700,466

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE WHEREIN SILICON SUBSTRATES ARE BONDED TOGETHER

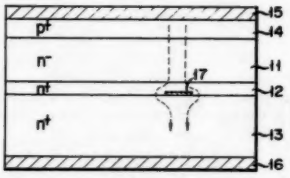
Akio Nakagawa, Hiratsuka; Hiromichi Ohashi, Yokohama; Tsuneo Ogura, Kamakura, and Masaru Shimbo, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 3, 1986, Ser. No. 825,544

Claims priority, application Japan, Feb. 8, 1985, 60-22937

Int. Cl.[4] H01L *21/461*

U.S. Cl. 437—247 **10 Claims**



1. A method of manufacturing a semiconductor device, wherein a silicon wafer having a first impurity-doped layer and a second impurity doped layer with a higher impurity concentration than said first impurity-doped layer is formed, comprising the steps of:

providing a first silicon substrate having a first impurity-doped layer and a third impurity-doped layer which has a higher impurity concentration than that of said first impurity-doped layer, said third impurity-doped layer having a mirror-polished surface;

providing a second silicon substrate having a higher impurity concentration than that of said first impurity-doped layer and the same conductivity type as said third impurity-doped layer, said second silicon substrate having a mirror-polished surface;

bringing the mirror polished surfaces of said third impurity-doped layer and said second silicon substrate into contact in a clean atmosphere so that virtually no foreign substances are present therebetween; and

annealing said first and second silicon substrates with the mirror-polished surfaces in contact with each other at a temperature of at least 200° C. so as to bond said substrates together without fusion, thereby forming a silicon wafer with said third impurity-doped layer and said second substrate bonded together and forming a second impurity-doped layer.

4,700,467

PROCESS FOR GROUNDING FLAT DEVICES AND INTEGRATED CIRCUITS

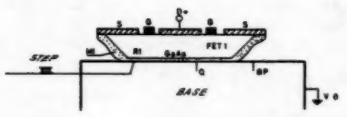
Giampiero Donzelli, Milan, Italy, assignor to Telettra-Telefonia Elettronica e Radio, S.p.A., Italy

Filed Jun. 7, 1985, Ser. No. 742,520

Claims priority, application Italy, Jun. 22, 1984, 21553 A/84

Int. Cl.[4] H01L *21/78*

U.S. Cl. 437—209 **2 Claims**



1. A process for grounding flat devices and integrated circuits, in particular microwave devices, e.g., power FETs, especially of the GaAs type, that consist of a base of Ga arse-

nide on which three contacts S (source), LD (drain) and G (gate) are provided, characterized in that:

(I) a GaAs wafer (W) carrying several flat devices (chips) is fixed on a rigid support (SR);

(II) a layer of photoresist (FR) is laid on the free or rear surface of said wafer (W) (i.e., the surface not touching the support);

(III) a photomask is made on the photoresist (FR) in order to obtain openings along borders of single devices present on the face of the wafer (W) touching the support;

(IV) the GaAs material under said openings made in the photoresist is removed until the single devices are completely separated and the source (S) contacts become accessible;

(V) the remaining photoresist still present on the rear of the devices is removed;

(VI) metal is deposited over the entire rear surface and side edges of each device and contacts the source (S) of each device on both edges of each device in all the openings formed by the GaAs removal of step IV;

(VII) the single devices thus metallized on the rear surface are extracted from the support; and

(VIII) the so metallized rear face of the single chips disconnected one from the other is soldered to a grounded package base.

4,700,468

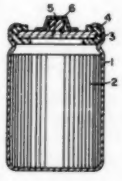
METHOD OF ASSEMBLING A CYLINDRICAL STORAGE BATTERY

Nikolai N. Volkhin; Vladimir P. Ardabatsky, and Valery V. Luzin, all of Leningrad, U.S.S.R., assignors to Vsesojuzny Nauchnoissledovatelsky Proektno-Konstruktorsky I Tekhnologichesky Akkumulyatorny Institut, Leningrad, U.S.S.R.

Filed Jun. 26, 1986, Ser. No. 879,023

Int. Cl.[4] H01M *10/04*

U.S. Cl. 29—623.2 **1 Claim**



1. A method of assembling a cylindrical storage battery, comprising the following sequence of operations:

installing a block of electrodes in a body of a cylindrical storage battery, which body has an edge;

mounting a lid of said cylindrical storage battery on the body of said storage battery which lid has an opening;

accomodating a gasket between said edge of said body and said lid;

rolling-in said edge of said body via said gasket to said lid;

filling said body with a measured quantity of electrolyte through said opening in said lid;

electrically charging and discharging said cylindrical storage battery; and

mounting a valve above said opening in said lid.

4,700,469

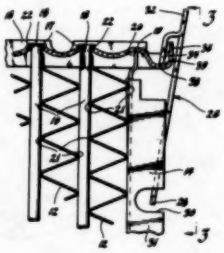
DETACHABLE CLAMP FOR FIXTURING HEAT EXCHANGER CORE ASSEMBLIES FOR BRAZING IN COMBINATION WITH THE HEAT EXCHANGER CORE

Karl P. Kroetsch, Williamsville, and Peter G. Wolf, Tonawanda, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1986, Ser. No. 843,040

Int. Cl.[4] B23P *15/26*

U.S. Cl. 29—726 **3 Claims**



1. In combination, a heat exchanger core having reinforcements extending along opposite sides thereof and headers at opposite ends thereof, a detachable clip for separately fixturing each of the reinforcements to one of the headers during brazing of the core and the reinforcements to the headers at junctures thereof and wherein the reinforcements may be assembled prior to brazing with substantial air space at their junctures with the headers but not exceeding a prescribed limit, characterized by the clip being made of a material having a coefficient of thermal expansion substantially less than the reinforcements so as to draw the reinforcements and headers together during brazing through a distance at least equal to the prescribed air space limit to thereby assure contact at all the junctures between the reinforcements and headers during the brazing thereof.

4,700,470

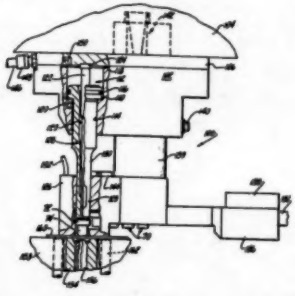
FASTENER INSTALLATION APPARATUS

Rudolph R. M. Muller, Frankfurt, Fed. Rep. of Germany, assignor to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 657,570, Oct. 4, 1984, Pat. No. 4,610,072, which is a continuation-in-part of Ser. No. 563,833, Dec. 21, 1983, Pat. No. 4,555,833, which is a continuation-in-part of Ser. No. 485,099, Mar. 28, 1983, Pat. No. 4,459,073, which is a continuation-in-part of Ser. No. 504,074, Jun. 14, 1983, abandoned. This application Jun. 2, 1986, Ser. No. 869,507

Int. Cl.[4] B23P *19/00*; **B23Q** *7/10*

U.S. Cl. 29—798 **7 Claims**



1. An installation apparatus for installing female elements in

a panel in a continuous operation, said female elements each having a portion, an annular barrel portion extending from said body portion having a free open end, and a bore extending through said body portion communicating with the opening through said barrel portion,

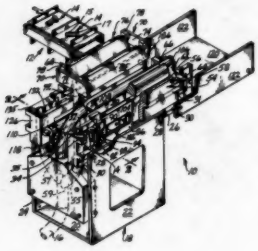
said apparatus comprising a base member adapted to be fixed relative to one die press member of a die press set having opposed relatively moveable die press members, an annular plunger reciprocably supported in said base member having a shank portion extending through an opening in said base member, a said nose member normally spaced from and moveable relative to said base member having a plunger passage receiving said plunger extending shank portion and a second passage intersecting and communicating with said plunger passage receiving said female elements for installation by said apparatus, said annular plunger having an guide passage extending axially therethrough, a piercing punch telescopically disposed in said plunger axial passage and said plunger reciprocal on said piercing punch, said piercing punch having an axial length greater than said plunger and fixed relative to said base member during installation of said female elements, said plunger moveable relative to said base member a predetermined distance, biasing means normally biasing said plunger relative to said base member shank portion extending into said nose member plunger passage around said punch, a shearing die for supporting said panel having an opening complementary to and receiving said piercing punch, and actuating means relatively closing said base and nose members upon receipt of a female element in said plunger passage from said second passage opposite said plunger in an installation ready position, relative closing movement of said nose and base members causing said plunger annular end portion to first engage said female element, biasing said barrel portion free end against a panel located opposite said plunger passage, under the force of said biasing means said punch end portion then extending through said female element body portion bore and said barrel portion opening and piercing a slug from said panel, said plunger then driving said female element barrel portion free and into said panel, installing said female element in the pierced panel opening.

4,700,471

DEVICE FOR ORIENTING AND CONVEYING A HEADED FASTENER

Paul J. Shemeta, Seattle, and Daniel A. Hendricks, Bothell, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 14, 1985, Ser. No. 797,962
Int. Cl.[4] **B23Q** *7/10, 7/12;* **B65H** *9/00*
U.S. Cl. 29—809 **11 Claims**



1. A device for orienting and conveying a headed fastener comprising:

(a) a support frame;

(b) an elongate guide member attached to the support frame, the guide member having a guide groove formed therein, the guide groove having an upper section and a lower section and an output end, the guide groove being configured so that when a headed fastener is dropped into the guide groove the head of the fastener will pass into the upper section of the guide groove but not into the lower section and the shank portion of the headed fastener will pass into the lower section of the guide groove, the headed fastener thereby assuming an oriented position within the guide groove;

(c) a ram, the ram being shaped to fit within the guide groove and operable for longitudinal movement through the guide groove to contact the headed fastener in the guide groove and move the headed fastener along the length of the guide groove, the ram having gyration means attached to the end of the ram that contacts the headed fastener for creating rotational movement of the headed fastener as the headed fastener is moved along the guide groove, the ram being configured to push the headed fastener to the output end of the groove, and,

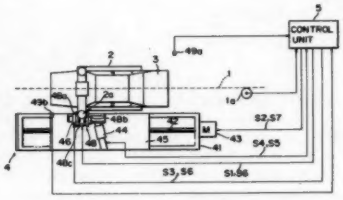
(d) conduit means operatively associated with the output end of the guide groove for receiving the headed fastener after it leaves the output end of the guide groove.

4,700,472

WORKING APPARATUS PROVIDED ALONG A WORKPIECE CONVEYOR

Kozo Muranaka, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 11, 1986, Ser. No. 828,266
Claims priority, application Japan, Feb. 19, 1985, 60-22256[U]
Int. Cl.[4] **B23P** *19/00*
U.S. Cl. 29—822 **5 Claims**



1. A working apparatus provided along workpiece conveying means for conveying in a direction carrying means on which a workpiece is placed, said working apparatus including working means for accomplishing a predetermined work on the workpiece which is being conveyed by the carrying means moving in the conveying means, carriage means movable along said conveying means and carrying said working means, gripping

means provided on said carriage means for movement on said carriage means in a direction substantially parallel with the direction in which said carrying means is moved by said conveying means, said gripping means including first clamping means for clamping the gripping means to said carrying means

on the conveying means, said carriage means including second clamping means for clamping the gripping means to said carriage means, first detecting means for detecting said carrying means on said conveying means and producing a first detection signal, first clamp actuating means responsive to

said first detection signal to actuate said first clamping means, second detecting means for detecting that the workpiece on said carrying means is in a predetermined position with respect to said carriage means and producing a second detection signal, driving means responsive to said second

detection signal for driving the carriage means in a direction parallel to the direction of movement of the carrying means in the conveying means, second actuating means responsive to said second detection signal to actuate said

second clamping means to thereby clamp the gripping means to the carriage means.

4,700,473

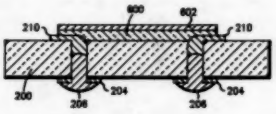
METHOD OF MAKING AN ULTRA HIGH DENSITY PAD ARRAY CHIP CARRIER

Bruce J. Freyman, N. Lauderdale; Dale Dorinski, and John Shurboff, both of Coral Springs, all of Fla., assignors to Motorola Inc., Schaumburg, Ill.

Division of Ser. No. 816,164, Jan. 3, 1986. This application Sep. 2, 1986, Ser. No. 902,819

Int. Cl.[4] H05K *3/10*

U.S. Cl. 29—846 **7 Claims**



1. A method of fabricating an improved chip carrier having a ceramic base providing a hermetically-sealed package, the method comprising the steps of:

preparing the ceramic base, which consists of a single pre-fired ceramic substrate having a top major surface and a bottom major surface and which has an array of conductive through holes, each through-hole surrounded by conductors on both top and bottom major surfaces and plugged by solder plugs substantially therethrough other than on the top surface, so as to electrically connect, via a plurality of conductive runners that outwardly extend on the top surface, to an arrangement of pads near the periphery of the top surface thereof; and

preparing a single, flexible dielectric slip for placing as a solid sheet on and affixing to said single, pre-fired ceramic substrate, within the arrangement of pads, for covering said array of through-holes plugged by solder plugs substantially therethrough other than on the top surface as well as a portion of said plurality of conductive runners, and having a top surface for affixing a semiconductor chip,

said single, flexible dielectric slip providing an insulated die mount pad as well as a dielectric layer for the semiconductor chip to allow utilization of the area therebeneath for said plurality of conductive runners and said solder-plugged through-holes forming a pad array interface on the bottom surface of said single, prefired ceramic substrate as well as providing a hermetic seal for each through-hole therein, thereby providing a hermetically-sealed, ultra high density pad array chip carrier which is able to accommodate a wide variety of semiconductor chips.

4,700,474

APPARATUS AND METHOD FOR TEMPORARILY SEALING HOLES IN PRINTED CIRCUIT BOARDS

Edward J. Choinski, Wayland, Mass., assignor to MultiTek Corporation, Wayland, Mass.

Filed Nov. 26, 1986, Ser. No. 935,255

Int. Cl.[4] H05K *3/10*; **B32B** *31/00*

U.S. Cl. 29—846 **8 Claims**

1. A method for temporarily sealing holes in a printed circuit board laminate, said method comprising the steps of:

A. forming a sandwich comprising:

(i) a first component having a melting point, said first component comprising a flexible, thermally conductive sheet material;

(ii) a second component having a melting point that is lower than the melting point of said first component, said second component comprising a sheet of thermodeformable material;

(iii) a printed circuit board laminate having holes therein, said printed circuit board being positioned with the second component sheet of thermodeformable material in contact with one side of the printed circuit board laminate and covering at least some of said holes; and,

(iv) a compressible porous release sheet positioned in contact with the other side of the printed circuit board laminate;

B. placing said sandwich in a thermo-vacuum apparatus comprising:

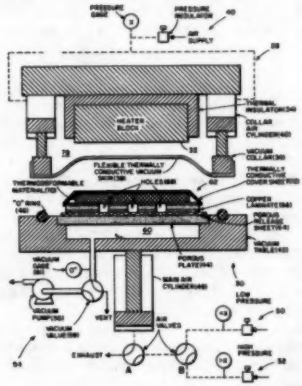
(1) a heater block assembly comprising:

(a) a temperature controlled, insulated heater block means;

(b) a vacuum collar means surrounding said heater block means;

(c) a flexible, thermally conductive vacuum skin means secured to said vacuum collar means;

(d) fluid actuated cylinder means connected to said vacuum collar means for moving said collar means and said flexible, thermally conductive vacuum skin means between an extended position and a retracted position with movement to said extended position being in response to the application of fluid at a pressure X to said fluid actuated cylinder means with said extended position locating the flexible, thermally conductive vacuum skin in spaced relation with respect to said heater block means;



(2) a vacuum table assembly comprising:

(a) vacuum table means;

(b) a flat, porous plate means mounted on said vacuum table means so that the upper side of the porous plate means is parallel with the surface of the vacuum table means;

(c) vacuum sealing means located on said vacuum table means for establishing a vacuum sealing relation with the flexible, thermally conductive vacuum skin means of said heater block assembly;

(d) fluid actuated main cylinder means connected to said vacuum table means for moving said vacuum table means from a retracted position to an intermediate vacuum sealing position and then to a contact position and vice versa,

said fluid actuated main cylinder means moving said vacuum table means to said intermediate sealing position in response to the application of a fluid at a pressure less than X to said fluid actuated main cylinder means at which position said sealing relation is established between the vacuum sealing

means and the flexible, thermally conductive vacuum skin of the heater block assembly and, said fluid actuated main cylinder means moving said vacuum table means from said intermediate sealing position to said contact position in response to the application of a fluid at a pressure greater than X to said fluid actuated main cylinder means at which position said flexible, thermally conductive vacuum skin is forced into thermally conductive contact with said heater block means;

(3) fluid pressure source means for applying fluid pressure at a pressure X to said heater block assembly fluid actuated cylinder means;

(4) fluid pressure source means for sequentially applying fluid pressure at a pressure less than X and then at a pressure greater than X to said vacuum table assembly fluid actuated main cylinder means said fluid pressure source means including means for releasing the fluid pressure applied to said vacuum table assembly fluid actuated main cylinder means; and,

(5) means for selectively applying and releasing a vacuum to said vacuum table means.

C. applying fluid pressure at a pressure X to said heater block assembly fluid actuated cylinder means;

D. applying fluid pressure at a pressure less than X to the vacuum table assembly fluid actuated main cylinder means so that the vacuum sealing means establishes said vacuum sealing relation with the flexible, thermally conductive vacuum skin means of the heater block assembly whereby a vacuum chamber is formed within which is located said sandwich;

E. drawing a vacuum in said vacuum chamber so that the flexible, thermally conductive vacuum skin conforms around the sandwich whereby the layered components of the sandwich are forced against the flat, porous plate means;

F. applying fluid pressure at a pressure greater than X to the vacuum table assembly fluid actuated main cylinder means whereby the heater block means forcibly contacts the flexible, thermally conductive vacuum skin;

G. transferring heat from said heater block means to the thermally deformable sheet material until the sheet material has deformed into and filled the holes of the printed circuit board laminate;

H. reducing the fluid pressure applied to the vacuum table assembly main cylinder means to a pressure less than X so that the vacuum table means returns to said intermediate position to permit cooling of the sandwich;

I. releasing the vacuum in said vacuum chamber and removing the fluid pressure applied to said vacuum table assembly fluid actuated main cylinder means to allow the vacuum table means to return to its retracted position; and,

J. removing the sandwich from the vacuum table.

2. A thermo-vacuum apparatus comprising:

A. a heater block assembly comprising:

(1) a temperature controlled, insulated heater block means;

(2) a vacuum collar means surrounding said heater block means;

(3) a flexible, thermally conductive vacuum skin means secured to said vacuum collar means;

(4) means connected to said vacuum collar means for moving said collar means and said flexible, thermally conductive vacuum skin means between an extended position and a retracted position with said extended position locating the flexible, thermally conductive vacuum skin in spaced relation with respect to said heater block means;

B. a vacuum table assembly comprising:

(1) vacuum table means;

(2) a porous plate means mounted on said vacuum table means so that the upper side of the porous plate means is parallel with the surface of the vacuum table means;

(3) vacuum sealing means located on said vacuum table means for establishing a vacuum sealing relation with the flexible, thermally conductive vacuum skin means of said heater block assembly;

(4) means connected to said vacuum table means for moving said vacuum table means from a retracted position to an intermediate vacuum sealing position and then to a contact position and vice versa, with said sealing relation being established between the vacuum sealing means and the flexible, thermally conductive vacuum skin of the heater block assembly at said intermediate vacuum sealing position and said flexible, thermally conductive vacuum skin being forced into thermally conductive contact with said heater block means at said contact position;

C. control means for selectively controlling the movement of said vacuum collar moving means; and, said vacuum table moving means.

D. means for selectively applying and releasing a vacuum to said vacuum table means.

4,700,475

METHOD OF MAKING ELECTRICAL CONTACTS

Ernest M. Jost, Plainville, and Timo J. Santala, North Attleboro, both of Mass., assignors to Chemet Corporation, Attleboro, Mass.

Filed Feb. 28, 1986, Ser. No. 834,620
Int. Cl.[4] H01R *43/16*
U.S. Cl. 29—874 **10 Claims**

1. The method of making silver-cadmium alloy electrical contacts in which the cadmium content is oxidized adjacent one side only of the contact which comprises providing a tube of silver-cadmium alloy

providing at least one layer of parting compound within said tube,

compressing said tube to flatten it and force its inner face into close contact with said layer,

heating said flattened sealed tube in an oxygen-containing atmosphere to effect oxidation of the cadmium content of said alloy adjacent the outer surface of said flattened tube and to leave substantially unoxidized the cadmium content of said alloy adjacent the inner surface of said tube, and

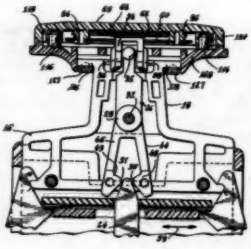
removing said layer of parting compound and cutting the wall of said flattened tube into individual electrical contacts.

4,700,476

SHAVER FOR A MEDICAL TREATMENT PREPARATION PROCEDURE

David R. Locke, Bridgeport, and Aivars Miska, Stratford, both of Conn., assignors to Remington Products, Inc., Bridgeport, Conn.

Filed Nov. 2, 1984, Ser. No. 667,647
Int. Cl.[4] B26B *19/02*
U.S. Cl. 30—43.91 **25 Claims**



1. A hair clipper having a disposable cutter head for the

preparation of a body site prior to medical treatment comprising:

a. a clipper housing adapted to be hand-held during hair clipping operations;

b. an electric motor positioned in said housing;

c. a drive coupling means positioned at said housing in mechanical engagement with said motor;

d. a disposable cutter head comprising an assembly of

(1) a first, stationary, cutter member having a plurality of cutter teeth,

(2) a second, moveable, cutter member having a plurality of teeth,

(3) said first and second cutter members positioned for reciprocating sliding engagement between said cutter teeth,

(4) a resilient member establishing a force on said second cutter member for maintaining sliding engagement between said first and second cutter members,

(5) a drive-coupling member mechanically engaging said second cutter member, said drive-coupling member engaging said drive coupling means and coupling an actuating drive force between said drive coupling means and said second cutter member,

(6) a cover member,

(7) a base member,

(8) said cover member and said base member each having a generally planar configuration and having outer, exposed surfaces thereof which define an enclosure for said disposable cutter head,

(9) means for mounting said cutter member, said resilient member, said drive member said cover member and said base member in a disposable assembly which enables reciprocating movement between said second movable cutter member in sliding engagement with said first stationary cutter member; and,

e. a manually actuated means for mounting said disposable cutter-head assembly to said housing and for dismounting said disposable cutter head from said housing, said cutter head assembly positioned on said housing for providing engagement between said drive-coupling member of said cutter head assembly and said drive-coupling means positioned at said housing.

4,700,477

EYEBROW TRIMMER

Ava Heller, 2929 Bonita St., Fort Myers, Fla. 33901

Filed Aug. 26, 1985, Ser. No. 769,087

Int. Cl.[4] B26B *21/08*

U.S. Cl. 30—51 **2 Claims**

1. An eyebrow shaper and trimmer comprising a narrow razor blade having a cutting edge, a front safety guard projecting forwardly in front of the razor blade, a rear safety guard positioned above and angularly inclined relative to the cutting edge of the razor blade, the razor blade being cradled between the front and rear safety guards and operable to engage the skin when the skin is depressed and stretched between the front and rear guards, a handle secured to the rear guard, a razor blade holder having slightly raised rear and side surfaces, the razor blade having contoured side and rear surfaces to position the razor blade in the holder, the rear safety guard being positioned to overlie the razor blade and the razor blade holder, aligned apertures in the rear safety guard, dowel pins projecting through the aligned apertures to hold the elements in assembled relation, the razor blade holder and the razor blade having aligned apertures therethrough and an aperture in the rear safety guard for the reception of the handle.

4,700,478

KNIFE FOR CUTTING THROUGH THE ADHESIVE THAT FASTENS A WINDOW PANE IN PLACE

Dieter Mezger, Weinheim; Georg Harsch, Stuttgart, and Gert Flachenecker, Leonberg, all of Fed. Rep. of Germany, assignors to C.& E. Fein Gmbh & Co., Stuttgart, Fed. Rep. of Germany

Filed Apr. 12, 1985, Ser. No. 722,605

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 8423004[U]

Int. Cl.[4] B26B *29/00*

U.S. Cl. 30—294 **9 Claims**

1. A knife blade for mounting in an oscillating tool to cut through adhesive fastening a window pane to a window frame, particularly in a motor vehicle; a rest member mounted on said mode and compossed of a soft plastic material for guiding the blade along the window frame free of contact therewith for reducing noise levels, said blade having a tang portion and a cutting said tang portion adapted to be mounted on said oscillating tool; said cutting portion having a thin, tapered free end cutting section and an intermediate non-cutting section; said rest member being mounted adjacent the juxture of said free end section and said intermediate section.

4,700,479

CANT ANGLE SENSOR ASSEMBLY

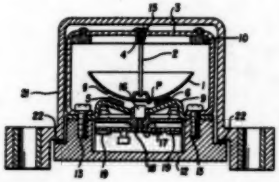
Kaoru Saito, Tokyo, Japan; Akio Noji, Warabi; Yonehiro Kakuta, Ohi, and Koichi Takigawa, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1986, Ser. No. 902,840

Claims priority, application Japan, Sep. 2, 1985, 60-134299[U]; Sep. 5, 1985, 60-196608

Int. Cl.[4] G01B *7/00*; G01C *9/06*

U.S. Cl. 33—366 **11 Claims**



1. A cant angle sensor assembly comprising:

non-magnetic, conductive cup-shaped member;

pendulum means suspending said non-magnetic, conductive cup-shaped member in a manner to freely rock in all directions;

at least two magnet means;

magnetic damper means with a stationary side along one face side of said cup-shaped member, said magnetic damper means including said at least two magnet means arranged on said stationary side along one face side of said cup-shaped member through a gap, said at least two magnet means having polarities opposite to each other with respect to said cup-shaped member; and

photo-sensor means for sensing the rocking state of said cup-shaped member in said all directions, said photo-sensor means includes an optically reflective pattern formed on the bottom of said cup-shaped member and a photo-sensor disposed at said stationary side of said magnetic damper means in a position to face said optically reflective pattern and to coact with said optically reflective pattern to sense the rocking state of said cup-shaped member in said all directions.

4,700,480

BASE STRUCTURE OF A MOTOR SAW

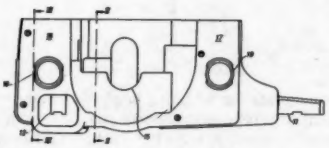
Bo R. Rangert, Mölnlycke, and Christer L. Alm, Landvetter, both of Sweden, assignors to AB Electrolux, Sweden

Filed Sep. 23, 1985, Ser. No. 778,671

Claims priority, application Sweden, Oct. 5, 1984, 8404998

Int. Cl.[4] F02B *77/02;* **F02F** *7/00;* **B23D** *57/02*

U.S. Cl. 30—383 **6 Claims**



1. In a base for an internal combustion engine chain saw, the base defining first and second compartments for the storage of gas and oil respectively and being molded of a plastic material; the improvement wherein said compartments are closed compartments substantially completely defined by an integral molded plastic body having walls, ceilings and bottoms of plastic material unitary with said saw base.

4,700,481

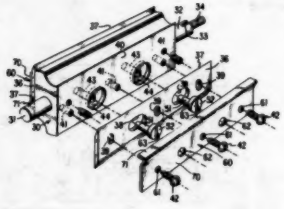
CUTTER HEAD ASSEMBLY FOR POWER PLANER

Michael E. Barrett, Easley, S.C., assignor to The Singer Company, Stamford, Conn.

Filed May 23, 1986, Ser. No. 866,534

Int. Cl.[4] B26D *1/00*

U.S. Cl. 30—475 **3 Claims**



1. A cutter head assembly for a power planer comprising:

an arbor including bearing means for rotatably supporting said arbor on an axis in a power planer;

said arbor formed with a flat blade accommodating surface;

a flat cutting blade arranged flush against said blade accommodating surface on said arbor;

a sharpened cutting edge formed along one side of said blade;

said arbor formed on said flat blade accommodating surface with spaced cavities each including a smooth cylindrical bore transverse to the blade accommodating surface and an enlarged counterbore adjacent said blade accommodating surface;

blade locating elements arranged one in each of said arbor cavities and each including a cylindrical pin rotatable in said bore and a head eccentric to said cylindrical pin extending through and protruding out of said counter bore;

said cutting blade being formed with adjustment slots each embracing the eccentric head of one of said blade locating elements, said adjustment slots each being elongated in a direction parallel to said sharpened cutting edge of the blade, whereby rotation of said blade locating elements influences adjustment of said blade cutting edge radially of said arbor axis; and

means for clamping said blade to said arbor in selected position of adjustment of said blade cutting edge.

4,700,482

SELF-SUPPORTING GRADUATION CARRIER

Heinz Kraus, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 22, 1986, Ser. No. 821,408

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1985, 3503144

Int. Cl.[4] G01D *5/34, 5/36*

U.S. Cl. 33—1 PT **9 Claims**

1. In a self-supporting graduation carrier of the type used in position and velocity measuring systems wherein the carrier comprises a galvano-plastically produced metal foil disk, the metal foil disc defining a center and a circumferential edge, the foil disc comprising a plurality of perforations located within an annular region about the center of the foil, the annular region of perforations defining a plane, the improvement comprising:

at least one first annular stability enhancement region located between the center of the foil and the annular perforation region; and

at least one second annular stability enhancement region located between the annular perforation region and the circumferential edge;

the first and second enhancement regions adapted such that a cross-sectional profile of the metal foil comprises at least one formation wherein the foil extends outwardly with respect to the perforation plane.

4,700,483

POSITION DETECTION DEVICE FOR MOVABLE HEAD

Toshio Tsujiuchi, Kariya, and Yasuo Niino, Gamagouri, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 29, 1986, Ser. No. 857,161

Claims priority, application Japan, Apr. 30, 1985, 60-63206[U]

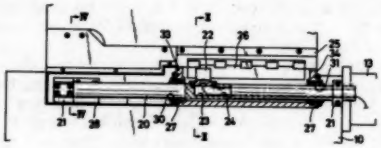
Int. Cl.[4] G01B *11/02*

U.S. Cl. 33—125 R **6 Claims**

1. A position detection device for a movable head which is movable on a stationary base for linear motion, comprising:

a closed housing secured to one of said movable head and said stationary base and having a pair of holes opening at opposite end walls thereof spaced in the moving direction of said movable head;

a support rod secured at opposite ends thereof to the other of said movable head and said stationary base in parallel relation with the moving direction of said movable head and passing through said housing at said pair of holes wherein said support rod is uniform in cross-sectional area at any point along its longitudinal axis so that no volume change occurs in a space defined by an inside surface of said closed housing and an external surface of said support



rod during movement between said closed housing and said support rod;

a linear scale secured to said housing within said housing and extending in parallel relation with said support rod; and

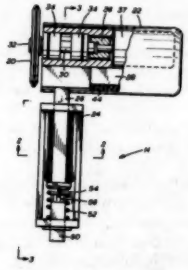
a scanning unit fixedly mounted on said support rod within said housing and responsive to the movement of said linear scale for detecting the position of said movable head.

4,700,484

DIAMETER MEASURING DEVICE

Jimmy I. Frank, Pearland, and John R. Wolfe, III, Pasadena, both of Tex., assignors to Gagemaker, Inc., Houston, Tex.

Filed Jul. 16, 1986, Ser. No. 886,514
Int. Cl.[4] G01B 3/12, 7/28
U.S. Cl. 33—142 **14 Claims**



1. An apparatus for measuring the diameter of an object having a continuously indexable surface, the object being located with respect to a fixed surface and rotatable about an axis, comprising:

fixture means attached to the fixed surface;

wheel means of known diameter rotatably attached to said fixture means, the rotational axis of said wheel means being substantially parallel to the rotational axis of the object to be measured;

said wheel means being adapted to contact the surface of the object to be measured and be movable in a direction parallel to the object rotational axis during object diameter measurement;

encoder means attached to said wheel means for producing a signal indicative of rotation of said wheel means;

start and end means for determining at least one revolution of the object about its rotational axis and for producing signals indicative of the start and end of a revolution and indicative of the number of revolutions completed;

means responsive to said encoder means and said start and end means for determining the rotational travel of said wheel means between the start and end of at least one revolution of the object and producing a signal indicative thereof;

means for calculating the diameter of the object responsive to said rotational travel determination means, said start and end means, and the diameter of said wheel means and for producing a signal indicative thereof; and

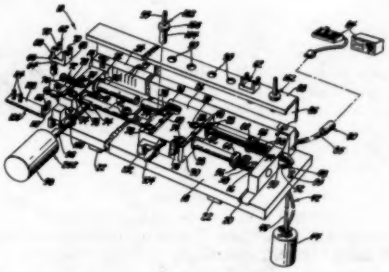
means responsive to said calculation means for displaying the calculated diameter of the object.

4,700,485

LINEAR MEASURING DEVICE

Leonard Caulfield, Van Wert, Ohio, assignor to Teleflex Incorporated, Limerick, Pa.

Filed Mar. 10, 1986, Ser. No. 838,171
Int. Cl.[4] G01B 7/02
U.S. Cl. 33—143 L **43 Claims**



1. A linear measuring device (10) for measuring the length of an element along an axis thereof, said device (10) comprising; a shaft (12), a first support means (14) for supporting one end of said shaft (12) and a second support means (16) for supporting the other end of said shaft (12) in spaced relationship to a support surface, a linear scale (24) along the length of said shaft (12) and interconnecting said support means (14,16), retaining means (62,162) attached to said first support means (14) and said movable means (26) for retaining one end of the element to said first support means (14) and the other end of the element to said movable means (26), and characterized by a movable means 26 supported by said shaft (12) for moving along the length of said shaft (12) to measure the length of the element with respect to said first support means (14) and detector means (80) for providing the linear displacement of said movable means (26) measured along said linear scale (24).

4,700,486

MEASURING THE THICKNESS FOR A CONTINUOUS MATERIAL WEB

Pertti Puumalainen, Kuopio, Finland, assignor to Puumalaisen Tutkimuslaitos Oy, Kuopio, Finland

Filed May 28, 1986, Ser. No. 867,687
Claims priority, application Finland, May 28, 1985, 852127
Int. Cl.[4] G01B 7/04, 7/10
U.S. Cl. 33—147 L **10 Claims**

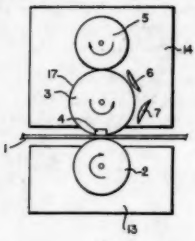
7. An apparatus for measuring the thickness for a material web comprising:

first and second rotatable wheels pressed against opposite sides of the web from the same position in space, the first wheel having a detecting element on its circumference and said second wheel having a conductive surface on its circumference;

said detecting element including a oscillatory circuit, said oscillatory circuit producing pulses which correspond to the frequency of its oscillation, said frequency varying because of the inductive interaction between said oscilla-

tory circuit and said conducting surface, wherein said oscillatory circuit produces a distance count in accordance with the distance between said oscillatory circuit and said conductive surface;

a calibration device associated with said first wheel, wherein



said oscillatory circuit produces a calibration count in accordance with the distance between said oscillatory circuit and said calibration device;

and data processing means for processing said distance count and said calibration count and generating therefrom a thickness measurement.

4,700,487

PROFILE SENSING ARRANGEMENT

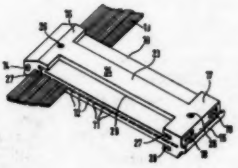
Normann Bögle, Reutlingen, Fed. Rep. of Germany, assignor to Wilhelm Bögle KG, Reutlingen, Fed. Rep. of Germany

Filed Jun. 30, 1986, Ser. No. 880,411

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3524211

Int. Cl.[4] G01B *5/20*

U.S. Cl. 33—175 **24 Claims**



1. A profile sensing device, comprising a housing having two longitudinal sides; a plurality of sensing rods supported in said housing substantially parallel to one another and extending beyond both longitudinal sides of said housing, said housing also having outer sides provided with coupling projections and openings, said sensing rods defining a central plane, said housing being elongated and provided with a plurality of throughgoing openings which are located at one side of said central plane and extend in a longitudinal direction of said housing for inserting an additional element.

4,700,488

ARRANGEMENT FOR ALIGNING A PRINTED CIRCUIT SUBSTRATE IN A PRINTING MACHINE

Ezio Curti, Strada Padana Superiore 57/59, I-20063 Cenusco s/N., Milan, Italy

Filed Feb. 12, 1986, Ser. No. 828,778

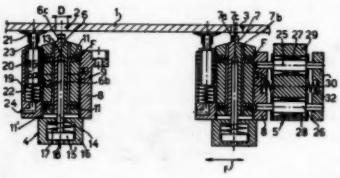
Claims priority, application Italy, Feb. 14, 1985, 19514 A/85

Int. Cl.[4] B23Q *3/00;* **B25B** *11/00*

U.S. Cl. 33—613 **27 Claims**

1. An arrangement for aligning a substrate preparatory to imprinting the latter with a printed circuit, the substrate having a plurality of locating holes, and said arrangement comprising a plurality of locating pins each of which has a longitudinal axis and an end portion; means mounting said locating pins to be positioned aligned with respective locating holes, each of said end portions including two unconnected sections constituting expandable means having a contracted condition in which the end portion is receivable in the respective locating hole with clearance, and further having an expanded condition; and operating means associated with each of said locating pins for urging the respective end portion from the contracted condition to the expanded condition and vice versa by translating the sections of each end portion substantially perpendicular to the respective longitudinal axis.

23. An arrangement for aligning a substrate preparatory to imprinting the latter with a printed circuit, the substrate having a plurality of locating holes, and said arrangement comprising a plurality of locating pins each of which has an end portion; means mounting said locating pins to be positioned aligned with respective locating holes, each of said end portions constituting expandable means having a contracted condition in which the end portion is receivable in the respective locating hole with clearance, and further having an expanded condition; operating means associated with each of said locating pins for urging the respective end portion from the contracted condition to the expanded condition and vice versa, said



mounting means comprising a plurality of supports each of which carries a respective locating pin and the associated operating means; means for displacing at least one of said supports transverse to the respective locating pin, said displacing means including a pair of substantially parallel guide members on said one support, and bearing means mounting said guide members for movement in a direction transverse to the respective locating pin, said one support having a rest position and a displaced position; and means for urging said one support to said rest position.

27. An arrangement for aligning a substrate preparatory to imprinting the latter with a printed circuit, the substrate having a plurality of locating holes, and said arrangement comprising a plurality of locating pins each of which has an end face, and an end portion extending from and defining a shoulder with the end face, of said end portions having a pair of plane, generally parallel surfaces; means mounting said locating pins to be positioned aligned with respective locating holes, each of said end portions constituting expandable means having a contracted condition in which the end portion is receivable in the respective locating hole with clearance, and further having an expanded condition; and operating means associated with each of said locating pins for urging the respective end portion from the contracted condition to the expanded condition and vice versa.

4,700,489

SQUARE LEVEL MEASURING TOOL

Anthony J. Vasile, 101 Sea Island La., Boca Raton, Fla. 33445

Filed Sep. 2, 1986, Ser. No. 902,648

Int. Cl.[4] B43L *7/00;* **G01B** *3/10*

U.S. Cl. 33—342 **9 Claims**

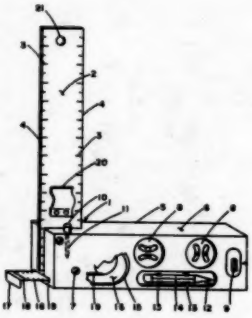
1. Square-level-measuring tool comprising

square assembly composed by graduated scale means rigidly attached to a straight stock means by fasteners;

a set of bubble levels and stud finder means affixed within said straight stock means;

scriber means received in a hollow bore within said straight stock means;

marking device means held by spring clip means within said straight stock means;



recoil-type measuring tape means having a metal catch affixed to its end mounted within and extending from said straight stock means;

attachment clip means affixed to said scale means and a hollow bore through said scale means.

4,700,490

COMPASS

Melvin G. Kramer, and Marlin D. Iden, both of Riverton, Wyo., assignors to The Brunton Company, Riverton, Wyo.

Continuation of Ser. No. 692,648, Jan. 16, 1985, abandoned. This application Jul. 31, 1986, Ser. No. 891,059

Int. Cl.[4] G01C *17/06*

U.S. Cl. 33—355 D **10 Claims**

1. In a compass wherein a pivot member projects upwardly from the base of a housing and a pointer assembly includes diametrically opposed pointer arms mounted on said pivot member, the improvement comprising:

an annular magnetic disk composed of a molded plastic material having magnetic particles embedded therein oriented in the direction of the earth's magnetic field, means for suspending said magnetic disk from said pivot member so that said disk is spaced beneath respective proximal portions of said pointer arms, said pointer arms extending in a direction parallel to the magnetic field of said magnetic disk, said magnetic disk having a chordal portion removed from said disk beneath one of said pointer arms so that said disk is weighted in a direction to counterbalance the vertical component of the magnetic forces of the earth.

4,700,491

COLOR-CODED RULER FOR THREE-PHASE WIRING

Troy E. Rhea, Jr., 3530 Mark Twain, Memphis, Tenn. 38127

Filed Feb. 12, 1986, Ser. No. 828,702

Int. Cl.[4] B43L *7/02*

U.S. Cl. 33—494 **6 Claims**

1. An electrician's color-coded ruler for identifying the wiring pattern of the three desired colors of the wire conductors to be connected to the respective phases of sequentially numbered poles of a three-phase panelboard, the ruler including sequentially numbered numerals each colored in one of the three desired colors corresponding, in a repeating pattern, to the sequentially numbered poles of the three-phase panelboard, the pattern defined as the first two numerals and numbered

poles corresponding to the first desired color, the successive two numerals and numbered poles corresponding to the second desired color and the successive two numerals and numbered poles corresponding to the third desired color.

4,700,492

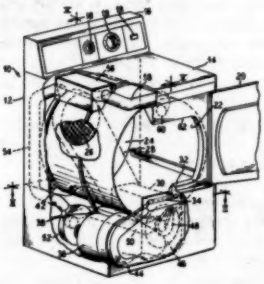
AIR ACTUATED AUTOMATIC LINT SCREEN CLEANING SYSTEM FOR DRYER

Kurt Werner, St. Joseph Township, Berrien County; Gregory L. Malchow; Keith E. Carr, both of Lincoln Township, Berrien County, and Robert A. Brenner, St. Joseph Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 5, 1986, Ser. No. 826,181

Int. Cl.[4] F26B *3/04, 21/02*

U.S. Cl. 34—32 **9 Claims**



1. A method for cleaning a circular lint screen in a clothes dryer including a blower for generating a first air flow through said circular lint screen, comprising:

accumulating lint on a first side of said circular lint screen by said first air flow during operation of said dryer;

directing a restricted second air flow through said lint screen in a direction opposite to said first air flow to remove lint accumulated on said first screen side, said restricted second air flow being directed through a narrow radially extending region of said circular lint screen from substantially the center of said screen to adjacent the edge of said screen, said radially extending region through which said second air flow is directed being wider adjacent said edge of said screen than at said center of said screen;

moving said restricted second air flow rotationally relative to said lint screen to cause oppositely directed air flow

through substantially all of said lint screen in a predetermined time period;

transporting lint removed from said lint screen to a lint reservoir; and

storing lint that has been transported within said lint reservoir.

4,700,493

DRYER DIFFERENTIAL PRESSURE CONTROLLER

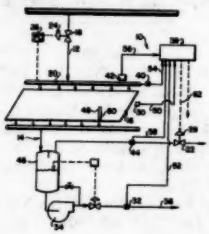
Gregory L. Wedel; Robert C. Fosler, both of Beloit, and Stanley P. Garvin, Jr., Janesville, all of Wis., assignors to Beloit Corp., Beloit, Wis.

PCT No. PCT/US86/00195, § 371 Date Mar. 14, 1986, § 102(e) Date Mar. 14, 1986, PCT Pub. No. WO87/04475, PCT Pub. Date Jul. 30, 1987

PCT Filed Jan. 28, 1986, Ser. No. 842,260

Int. Cl.[4] F26B *13/18*

U.S. Cl. 34—48 8 Claims



1. A control apparatus for controlling the differential pressure between a steam inlet line and an outlet line of a web dryer, said apparatus comprising in combination:

a selectively controllable outlet valve disposed within the outlet line of the dryer for selectively controlling the flow of steam, condensate and non-condensible gases out of the dryer;

outlet valve actuating means disposed adjacent to said outlet valve for selectively controlling the operation of said outlet valve between a fully open and a fully closed setting therof;

speed sensing means disposed adajcent to the dryer for sensing the rotational speed of the dryer and for generating a first control signal proportional to said sensed rotational speed of the dryer;

rate of condensation sensing means for sensing the rate at which a layer of condenste build up within the dryer and for generating a second control signal proportional to said sensed rate of buildup; and

control means operably connected to said outlet actuating means for selectively energizing said actuating means in response to said control signals generated respectively by said speed sensing means and said rate of condensation sensing means such that the control means compares said signals from said speed sensing means and said rate of condensation sensing means to determine the minimum setting of the outlet valve and increasing said minimum setting by an optimum amount so that flooding of the dryer with condensate is inhibited while the differential pressure between the inlet and outlet lines is maintained as low as possible thereby avoiding the possibility of flooding caused by increased condensate flow, fluctuation in pressure differential and speed increase of the dryer.

4,700,494

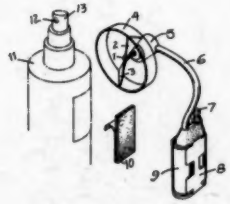
APPARATUS FOR DRYING HAIR SPRAY AND OTHER COMPOSITIONS

Danny W. Pridgen, P.O. Box 2204, Pine Circle, Gainesville, Ga. 30503

Filed Sep. 15, 1986, Ser. No. 907,230

Int. Cl.[4] A45D *20/00*

U.S. Cl. 34—90 6 Claims



1. An apparatus for drying hair spray or other compositions released from a container comprising:

rotatable fan blades for drying spray as it leaves said container;

a motor for rotating said fan blades;

a battery holder attached to said container for holding a battery for supplying power to said motor;

an adjustable flexible conduit for supporting said motor and said fan blades in a chosen position in relation to said container and housing a wire for conducting current from said battery to said motor; and

a switch for controlling the operation of said fan blades.

4,700,495

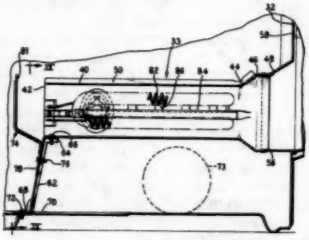
HEATER ASSEMBLY AND MOUNTING ARRANGEMENT FOR A DRYER

Reinhold A. Drews, Lincoln Township, Berrien County; Karl Jautakis, Chikaming Township, Berrien County, and Mark E. Kuyper, Grandville, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 22, 1986, Ser. No. 909,861

Int. Cl.[4] F26B *11/04*

U.S. Cl. 34—133 14 Claims



1. A heater assembly for a clothes dryer, wherein said dryer has a rotating drum within a cabinet having an openable front panel and an air conduit with a first opening into said cabinet and a second opening into said drum comprising:

a heater housing having a first open end slidably engagable with said first opening in said air conduit and a second opeend accessible from and mountable near the front of said dryer behind said openable panel;

said heater housing being removably attached to said dryer cabinet by fastening means attached near said second open end of said heater housing; and

a heater means mountable within said housing and being accessible and removable from the front of the dryer through said second open end of said heater housing;

whereby, said heater housing and heater means can be serviced and removed from said dryer directly from the front of said dryer without having access to the rear of said dryer.

4,700,496

BOOT, IN PARTICULAR SKI BOOT, WITH A MONOLITHIC STRUCTURE

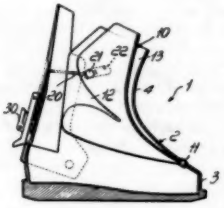
Alessandro Pozzobon, Treviso, Italy, assignor to NORDICA S.p.A., Montebelluna TV, Italy

Filed Jun. 9, 1986, Ser. No. 872,330

Claims priority, application Italy, Jun. 13, 1985, 21146 A/85

Int. Cl.[4] A43B *5/04*; A43C *11/00*

U.S. Cl. 36—117 **10 Claims**



1. A boot structure of monolithic type comprising, an enbloc body defining a shell portion and a front quarter portion integral therewith,

a rear quarter hinged to said shell portion,

said front quarter portion and said rear quarter defining a leg area having a front part of the leg area and a rear part of the leg area,

a tiltable internal quarter facing internally said front quarter portion and having a lower end portion connected to said body and extending at least over the front part of the leg area,

closing means including an actuating mechanism fixed on the rear quarter and transmission means for transmitting the actuating action of said actuating mechanism,

wherein said transmission means have at least one end portion thereof fixed to said internal quarter and at least another opposite end portion connected to said rear quarter through said actuating mechanism thereby to tilt said internal quarter towards said rear quarter through a first tilting angle when said actuating mechanism is actuated to close said boot,

and wherein said one end portion of said transmission means includes engagement means for slidably engaging within limits said front quarter portion,

said front quarter portion having stop means defining said limits of slidable engagement between said engagement means and said front quarter portion,

thereby to tighten said front quarter portion towards said rear quarter portion when said closing action on said actuating mechanism is continued beyond said first tilting angle and said engagement means reach said stop means.

4,700,497

AUTOMATIC DOCUMENT PAGE TURNING APPARATUS

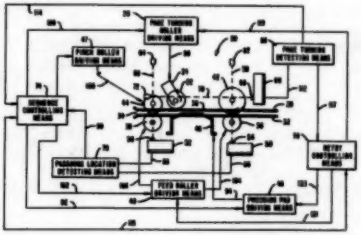
Susumu Sato, Ninomiya, and Toshio Arashida, Chigasaki, both of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 8, 1986, Ser. No. 905,096

Claims priority, application Japan, Dec. 20, 1985, 60-285901

Int. Cl.[4] G09F *19/00*

U.S. Cl. 40—531 **18 Claims**



1. A page turning apparatus comprising

means for driving a multiple-page document along a feed path to a page turning station,

means positioned adjacent the feed path and supported for movement in a direction for engaging and moving a page of the document positioned at the turning station to a bowed condition when actuated,

means for actuating said engaging and moving means,

page turning means positioned adjacent the turning station for engaging the page and moving the page to a partially turned position, and

means driving the document a further distance along the feed path for enabling the page turning means to move the page to a fully turned position.

4,700,498

PORTABLE DISPLAY APPARATUS

Simon G. A. Perutz, Evanston, and Gerald E. A. Perutz, Kenilworth, both of Ill., assignors to Nimlok Company, Morton Grove, Ill.

Filed Nov. 12, 1985, Ser. No. 797,168

Int. Cl.[4] G09F *17/00*

U.S. Cl. 40—603 **15 Claims**

1. A portable display apparatus comprising a display means adapted to assume either an operative or inoperative mode, when in an operative mode assuming an upright substantially partition-like configuration with a large exposed display surface, and when in an inoperative mode assuming a collapsed condition and forming a small compact unit; and structural means adapted to assume either an assembled or disassembled state, when in an assembled state, engaging said display means and maintaining same in an operative mode; said structural

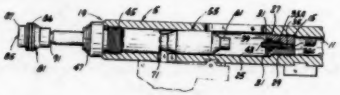
means, when in an assembled state, including elongated first structural members removably engaging opposed peripheral portions of the exposed display surface, when the latter is in an operative mode, and elongated second structural members operatively connected to said first structural member for supporting in a selected upright position said display means, while the latter is in said operative mode, said second structural members being disposed substantially rearwardly of the exposed display surface when said display means is supported in said selected upright position; when in a disassembled state, said first and second structural members being substantially disconnected from one another and adapted to be disposed in side by side, substantially parallel relation and positioned proximate the display means compact unit.

4,700,499

MUZZLE-LOADING RIFLE

William A. Knight, R.R. 5, Box 110-A, Unionville, Mo. 63565

Filed Jan. 21, 1986, Ser. No. 819,740
Int. Cl.[4] F41C *7/00, 17/04*
U.S. Cl. 42—51 **17 Claims**



1. A muzzle-loading rifle comprising:

a barrel having an axial bore therethrough;

an elongate receiver formed integrally with said barrel at the breech end of the barrel, said receiver extending rearwardly from the barrel and having an axial bore therethrough generally coaxial with the bore through the barrel;

an end cap at the rearward end of the receiver having a bore therethrough generally coaxial with said receiver bore;

a bolt of integral one-piece construction slidable in the bore of the receiver between a retracted position and a firing position;

said bolt having a body, a head at the forward end of the body and an elongate tailpiece at the rearward end of the body extending endwise from the body through said end cap bore and projecting rearwardly beyond said end cap, said tailpiece forming a handle adapted to be grasped and pulled to slide the bolt, without rotating the bolt, to said retracted position;

spring means associated with the tailpiece of the bolt and reacting against the rearward end of the body of the bolt for urging said bolt forwardly toward its firing position; and

means on the body of said bolt for receiving a trigger sear to hold the bolt in said retracted position against the urging of said spring means, said sear-receiving means being spaced forwardly of the forward end of said spring means a distance greater than the distance between the retracted and firing positions.

4,700,500

FIELD STRIPPING KEY PUNCH

L. Marvin Slappey, Jr., 416 W. Lamar St., Box 744, Americus, Ga. 31709

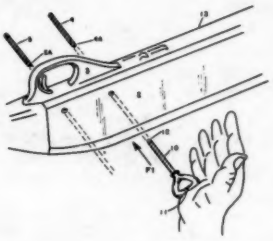
Filed Nov. 1, 1985, Ser. No. 794,005
Int. Cl.[4] F41C *27/00*
U.S. Cl. 42—90 **1 Claim**

1. A key-shaped punch tool attachable to a standard key ring and adapted to push out retaining pins that hold in place a trigger plate assembly in a firearm receiver, comprising:

(a) a member having four legs;

(b) a first leg thereof being substantially longer than the other three and having at one end thereof a tapered portion for engaging a substantial surface of the ends of said retaining pins lodged in said firearm receiver;

(c) said legs being joined together at juncture points, said first leg joining with said second and third legs at the juncture point thereof and defining angles of approximately 135° at its juncture with both said second leg and said third leg; said second and third legs define an angle of approximately 45° at their juncture, and said second and fourth legs and said third and fourth legs also define angles of approximately 45° at their junctures;



(d) said second, third and fourth legs forming an isometric, triangular configuration, said configuration forming a handle joined to said first leg to enable said first leg to push out said retaining pins from said receiver when a linear force is exerted on said handle;

(e) said first, second, and third legs being made of ¼ inch rounded stock material, and said fourth leg being made of ¼ inch half-rounded stock material; and

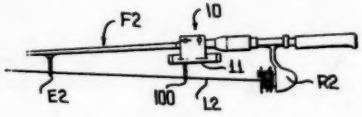
(f) said fourth leg having a continuous flat outer face and a continuous rounded inner face.

4,700,501

COMBINED FISHING ROD AND FISHING LINE VIBRATOR

George Bryan, 1401 Kingston Rd., Perry, Ga. 31069

Filed Feb. 18, 1987, Ser. No. 15,928
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—19.2 **10 Claims**



1. A combined fishing rod and fishing line vibrator comprising a housing defined by a tubular body having axially opposite open first and second ends, first and second caps closing said respective first and second ends, a pair of radial shoulders within said tubular body adjacent said first end, an eccentric-receiving chamber between said first cap and a first of said radial shoulders, an electric motor-receiving chamber between said radial shoulders, an electric motor in said electric motor-receiving chamber, a rotatable shaft projecting from said electric motor toward said first cap and supporting a weight eccentrically mounted and unbalanced with respect to the rotational axis of said shaft housed within said eccentric-receiving chamber, said second cap defining with said electric motor a battery-receiving chamber, electric switch means carried by said second cap for electrical connection to said electric motor, a fishing line loop fixedly secured to said tubular body for receiving a fishing line therein, and means for connecting said housing to a fishing rod whereby the rotating eccentric weight creates vibrations transferred directly to said rod through said

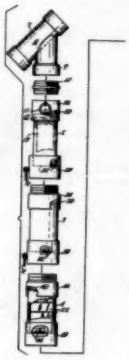
connecting means and to a fishing line through said fishing line loop.

4,700,502

SEGMENTED TUBULAR FISHING GEAR CONTAINER

Ronald F. McFarland, 684 Lone Oak Ave., Eugene, Oreg. 97404, and Richard A. Apparcel, 407 Panda Loop, Eugene, Oreg. 97401

Filed Jun. 16, 1986, Ser. No. 874,666
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—21.2 **3 Claims**



1. A fishing gear container transportable on the person and comprising in combination,

tubular segments in axial alignment with one another, each of said segments having an open end and a closed end and thereby adapted for the reception and storage of items of fishing gear,

threaded fittings carried at the ends of said tubular segments permitting coupling of the tubular segments to one another,

sling means on the container enabling supporting the container on the person,

pole holder means carried by one of said tubular segments, and

a stake assembly carried by one of the remaining tubular segments for ground insertion to maintain said pole holder means in place above a ground surface.

4,700,503

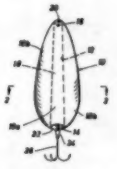
FISHING LURE

Aaron J. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 462,057, Jan. 28, 1983, Pat. No. 4,573,283, which is a continuation-in-part of Ser. No. 186,411, Sep. 12, 1980, abandoned. This application Nov. 25, 1985, Ser. No. 801,551
Claims priority, application Canada, May 22, 1985, 482042
The portion of the term of this patent subsequent to Mar. 4, 2003, has been disclaimed.
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.09 **17 Claims**

1. A fishing lure comprising:

a lure body having outer surfaces defining the general overall exterior size and configuration of said lure, said outer surfaces including an upper surface and a lower surface, said lure body having a cavity extending therethrough in a generally horizontal direction corresponding to the length of said lure body, said cavity having width extending transverse to the length and generally horizontally, and depth extending transverse to the length and generally vertically, the width of said cavity being greater than the depth over a major portion of the length of said cavity, the configuration of said cavity being dissimilar to said overall external configuration, and said body having an insert opening through the exterior thereof into one end of said cavity; and



an insert slidably mounted in said cavity but selectively removable from said cavity through said insert opening, said insert having length, width, and thickness generally parallel to the length, width, and depth, respectively, of said cavity, the width of said insert being greater than the thickness over a major portion of the length of said insert.

4,700,504

FISHING LURE

Robert N. Mattison, 5826 McKinley Pl. North, Seattle, Wash. 98103

Filed Jul. 30, 1986, Ser. No. 892,129
Int. Cl.[4] A01K *85/01*
U.S. Cl. 43—42.33 **23 Claims**

23. An illuminated fishing lure for housing an elongated chemiluminescent capsule, comprising:

a substantially hollow body formed by a wall fabricated of a translucent fluorescent polymer material, said body wall defining an interior waterproof body cavity and having opposing sidewall portions, at least one surface of said sidewall portions having formed thereon a plurality of smooth surface portions and surface discontinuities; and

means for removably holding the chemiluminescent capsule in transverse position within said body for light transmitted from the capsule to impinge upon said sidewall surface portions and to be emitted from said surface discontinuities with a high brightness level.

4,700,505

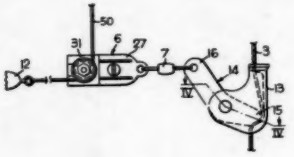
LINE RELEASE ON TROLLING DEVICE

Russell W. Weber, 6523 Sunnypoint Rd., Glendale, Wis. 53217

Filed Jun. 11, 1986, Ser. No. 873,601
Int. Cl.[4] A01K *91/00*
U.S. Cl. 43—43.12 **16 Claims**

2. A mounting device and line release mechanism comprising, a mounting device for selective positioning on a cable, said line release mechanism including a housing connected to said mounting device and defining a slideway and a latch element, a slide reciprocably mounted in said slideway, a latch member hinged to said slide for pivoting between a latched and retracted forward position and an unlatched and extended rearward position, a fishline retainer forming an interface with said

latch member for frictionally holding a fishing line on the forward portion of the interface, said latch member unlatching from said latch element and pivoting rearwardly to an extended position in response to a predetermined tension on the fishing line and allowing the fishing line to release rearwardly from the interface.



4,700,506

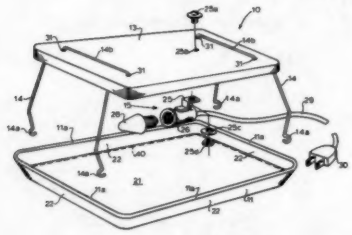
FLEA TRAP

Clarence O. Williams, Rocky Mount, N.C., assignor to Happy Jack, Inc., Snow Hill, N.C., a part interest

Filed Aug. 26, 1985, Ser. No. 769,260

Int. Cl.[4] A01M *1/04*

U.S. Cl. 43—113 **5 Claims**



1. A trap for catching wingless, non-flying fleas, comprising:

(a) a shallow pan having and supported by a flat bottom wall enabling said pan to be accessible to a source of fleas to be trapped and having formed edge portions on upstanding side walls thereof;

(b) a sticky substance disposed in said pan and providing a sticky landing surface above said bottom wall for live fleas to be trapped and killed;

(c) a cover having light reflective horizontal bottom surface and spaced apart pairs of holes extending through said surface;

(d) support means comprising a pair of wire-formed leg members, each said wire-formed leg member having a central portion resting against the top surface of said cover and leg portions extending from opposite ends of said central portion downwardly through a selected pair of said holes in said cover, each said leg portion having an intermediate portion formed to rest against the bottom surface of said cover, downwardly extending legs and at the lower ends of each said leg being formed to grasp said shallow pan formed edge such that when said legs are spread apart said intermediate portions bear against the bottom surface of said cover and said lower ends tend to resiliently grasp said shallow pan formed edge and thereby support said cover in vertically-spaced relation over said pan with said light reflective surface opposing the bottom wall of said pan and located to provide open unobstructed space between said cover and pan to permit said fleas to jump through said space into said pan to contact said sticky landing surface; and

(e) an electrically energized visible light source, said light source being secured to said cover below said light reflective surface thereby generating and exposing to the fleas sought to be trapped both reflected downwardly transmitted light and downwardly and outwardly transmitted directly radiated light mixed with said reflected light from said source.

4,700,507

TREE BARK PROTECTOR

Charles R. Allen, 4812 Sundew, Union Lake, Mich. 48085

Filed Mar. 31, 1986, Ser. No. 846,067

Int. Cl.[4] A01G *13/02*

U.S. Cl. 47—23 **1 Claim**

1. A shield assembly for protecting bark on the basal portion of a tree from the girdling action of lawn trimming equipment, comprising, in combination:

two identical half sections of molded high impact polyurethane plastic;

at least one aperture in a ground contacting portion of each half section;

a spike for inserting through each said aperture for anchoring the assembled shield in its protecting position, the improvement comprising:

the shield assembly having a cylindrical upper portion which gradually tapers downwardly and outwardly to an outwardly directed horizontal flange, said flange adapted to seat on the ground surface, said aperture located within the extent of said flange;

a horizontal, internally formed second flange extending inwardly from the top edge of the cylindrical upper portion and defining a central hole through which the trunk of a tree may extend, said second flange including at least one concentric V-shaped groove spaced between said top edge and said central hole to define at least one removable flange section, whereby the hole can be enlarged by removal of said removable flange section, to accommodate a larger tree trunk;

the facing edges of each half section including facing swollen wall portions, said swollen wall portions including apertures for receiving molded locking connector means; and,

molded locking connector means for interconnecting said facing edges of each half section, whereby, the half sections may be connected over the enlarged basal portion of a tree to shield the bark against contact by lawn trimming equipment.

4,700,508

PANE GUIDE FOR AN AUTOMOBILE SLIDING WINDOW

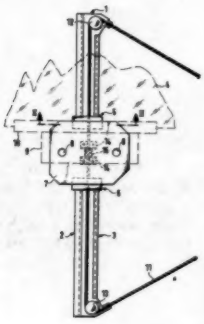
Harald Köllner, Altenstadt, and Georg Uhlig, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Rockwell Golde GmbH, Fed. Rep. of Germany

Filed Dec. 22, 1986, Ser. No. 944,131

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1986, 3600413

Int. Cl.[4] E05F *11/48*

U.S. Cl. 49—352 8 Claims



1. A pane guide for a sliding window for an automobile, the guide comprising a central guide rail for fixing to the automobile bodywork in the intended direction of movement of the window pane, flanges on the guide rail, spaced apart slide elements slidably engaging on said flanges of the guide rail so as to be orientated in use substantially perpendicularly and parallel to the window pane, a support plate to which said slide elements are fixed, which is connected in use with a force transmitting element of a hand-operated or electric motor-operated window winder and with a lifting rail engaging firmly on the lower edge of the pane for the guidance of the pane parallel to the direction of movement of the window pane, and the slide elements each comprise two guide surfaces parallel and opposite to each other in pairs, the distance between which is invariable and which engage around the associated flanges of the guide rail from both sides, at least one of said flanges of the guide rail is bent back to form a resilient pressure strip in such a manner that two externally situated bearing surfaces associated with one pair of said guide surfaces are formed, of which one of said bearing surfaces situated on the pressure strip as viewed in cross-section and with the slide elements not mounted, converges with the other of said bearing surfaces towards the end of the flange at an acute angle, the pressure strip bearing resiliently, when the slide elements are mounted, with said one bearing surface against the associated guide surface, whereas said other bearing surface bears against the guide surface associated with it.

4,700,509

SEALING GASKET BETWEEN A DOOR AND ITS RELATED SHOULDER ON A CABINET, IN PARTICULAR OF A REFRIGERATOR

Adriano Merla, Angera, Italy, assignor to Ilpea S.p.A., Malgesso, Italy

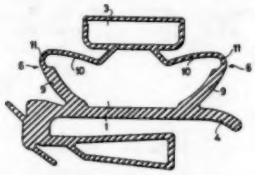
Continuation of Ser. No. 697,979, Feb. 4, 1985. This application Sep. 2, 1986, Ser. No. 902,124

Claims priority, application Italy, Feb. 8, 1984, 19503 A/84

Int. Cl.[4] E06B *7/19*

U.S. Cl. 49—487 4 Claims

1. A magnetic gasket for effecting a tight seal between a door and its related shoulder of a cabinet, comprising a chamber having a plurality of sides and acting as a seat for a magnetic insert and a tubular bellows section having a base and two sides extending from the base, said sides having ends, said ends of said sides being attached to one side of said chamber to form with said base said tubular bellows section, at least one of said sides defining sections of different degrees of stiffness coming



to a point of interconnection, said point of interconnection acting as a pivot for deformation as a result of closing the door, said section of a higher degree of stiffness being positioned between the base and said section of a lower degree of stiffness with sufficient side stability of the bellows as to prevent deformation effects during closing of the door.

4,700,510

SPINDLE STOCK UNIT FOR SURFACE GRINDING MACHINE

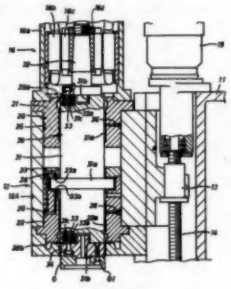
Yoshiharu Namba, 2-9-8, Nishishouji, Minoo-shi, Osaka-fu; Hiroshi Suzuki, Okazaki, and Kazuhiko Sugita, Anjoh, all of Japan, assignors to Toyoda Koki Kabushiki, Kariya and Yoshiharu Namba, Monoo, both of, Japan

Filed May 22, 1986, Ser. No. 865,857

Claims priority, application Japan, May 22, 1985, 60-109874

Int. Cl.[4] B24B *41/04*

U.S. Cl. 51—134.5 R 4 Claims



1. A spindle stock unit for grinding machines, comprising a spindle head, and a spindle assembly having a spindle body rotatably supported by a pair of axially spaced radial fluid bearings in said spindle head through a static pressure of fluid supplied between said spindle body and each of said axially spaced radial fluid bearings, said spindle body being integrally formed at an intermediate portion thereof with an annular flange disposed between a pair of axially spaced thrust fluid bearings in said spindle head and being positioned axially in place by said pair of axially spaced thrust bearings through a static pressure of fluid supplied between each of axial opposite end surfaces of said annular flange and each of said thrust fluid bearings,

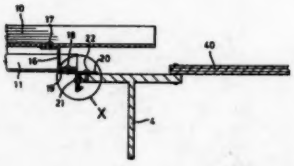
wherein said spindle body is made of crystallized glass of low coefficient of thermal expansion and has at least the same axial length as that between axial opposite ends of said pair of axially spaced radial fluid bearings.

4,700,511

PRESSURE RELIEF WALL ASSEMBLY

Joseph M. Minialoff, 25 Edgehill Rd., Islington, Ontario, Canada (M9A 4N1); Leonard E. Blendick, Toronto, and Thomas C. McCavour, Islington, both of Canada, assignors to Joseph M. Minialoff, Islington, Canada

Filed Jun. 4, 1984, Ser. No. 617,295
Claims priority, application Canada, Jun. 7, 1983, 429852
Int. Cl.[4] E04C *2/46*; E04B *1/98*
U.S. Cl. 52—1 **17 Claims**



1. A pressure relief wall assembly comprising a wall panel the terminology having ends and sides with a central portion of the panel, in use, being permanently secured to a frame, and fastener means which comprises:

securing means comprising a plurality of elements, which, in use, releasably fasten the ends of the wall panel to the frame and which fail when a first excess pressure is applied to either side of the wall panel;

and at either end of the panel a retaining means each of which retaining means comprises a retaining member and an engagement member mounted, in use, between a respective end of the panel and the frame, with the retaining member including a portion extending in the direction parallel to the plane of the wall panel and abutting the engagement member, whereby for deflection of the respective panel end in one direction the retaining member leaves the retaining member without obstructing the deflection, and for deflection in the other direction, after failure of said elements, the retaining member retains the respective end of the wall panel and prevents any substantial movement thereof, and the retaining member deflects so as to be released from the respective engagement member, thereby releasing the respective end to permit the applied pressure to dissipate, when a second excess pressure greater than the first excess pressure is applied to the other side of the panel after a further increase in the pressure applied to the wall panel in said other direction above a second excess pressure greater than the first excess pressure.

4,700,512

CORNER FLASHING MEMBRANE

Walter A. Laska, 5611 S. Austin, Chicago, Ill. 60638

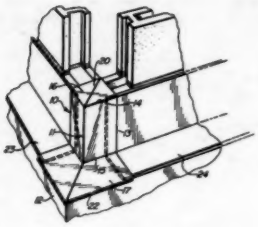
Filed Jul. 21, 1986, Ser. No. 887,444
Int. Cl.[4] E04B *1/66*; E04D *13/14*
U.S. Cl. 52—58 **6 Claims**

1. A reversible and foldable flashing membrane for interior masonry corner structures formed by two substantially vertical meeting walls abutting a horizontal structural member, the flashing membrane comprising:

a central section adapted to wrap around the vertical sides of the corner formed by the meeting walls, the central section having a top edge and a bottom edge;

a planar top section connected to the top edge of the central section and extending rearwardly and substantially horizontally into the corner formed by the meeting walls; and

a planar bottom section connected to the bottom edge of the central section and extending forwardly and substantially horizontally upon the horizontal structural member; said membrane being sufficiently flexible with no perepheral stiffening so as to be reversibly adaptable to sealing both outside and inside masonry corners, and so as to be foldable along a longitudinal center line to a planar configuration.

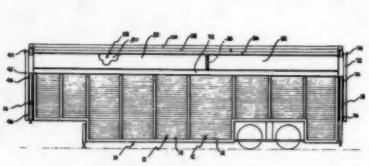


4,700,513

MOBILE UNIT FOR FACILITATING WOOD FRAME CONSTRUCTION

Kenneth W. Smith, 2626 Thorny Dr., Churchville, Md. 21028

Filed Sep. 8, 1986, Ser. No. 904,957
Int. Cl.[4] E04B *1/343*; B25N *1/12*; B60P *3/05*
U.S. Cl. 52—69 **15 Claims**



1. A mobile system for facilitating the construction of wood frame panels including in combination, a mobile truck body formed with a plurality of tool storage bays along a side thereof, means on the top of said body normally forming an enclosure for a panel-forming apparatus, a first panel adapted to occupy a stowed position on top of said enclosure forming means, a second panel adapted to occupy a stowed position on top of said first panel, crane means on said body for sequentially moving said second panel to an operative position at which an inner edge thereof is adjacent to a lower side edge of said body with said second panel substantially horizontal and moving said first panel to an operative position at which an inner edge thereof is adjacent to the upper side edge of said body and means for retaining said first and second panels in said operative positions to provide an upper working area adjacent to a panel-forming apparatus in said enclosure and a lower working area adjacent to said bays.

4,700,514

MONOCOQUE BUILDING SHELL

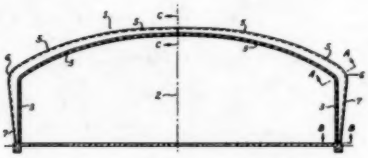
Richard G. Reineman, 601 Clubhouse Ave., Newport Beach, Calif. 92663

Filed Aug. 5, 1985, Ser. No. 762,424
Int. Cl.[4] E04B *1/32*
U.S. Cl. 52—86 **5 Claims**

1. A monocoque building shell of a given axial length formed by repeated elements adjoining along the axial length of the building, including roof and sidewall portions, composed of a compound curvature, a single, continuous curve in the transverse direction and a repeating curve in the axial direction, and all similar about an axial plane midway between the building sidewalls, the improvement comprising:

the shell made up of a continuous undulating wall of smooth wave-shaped form, the wave proceeding in its undulation

in the direction of the building axis, the amplitude and cycle length of the waves being defineable by cross sections through the shell made by planes parallel to the building axis, the amplitude of the waves being variable in



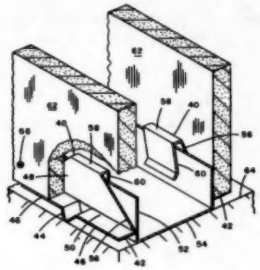
the cross sections which are made proceeding along the shell from the roof center to the bottom of the side walls, the amplitude at a given position being in direct proportion to the sum of all stressing moments determined to be imposed at the given position.

4,700,515

WALL PANEL LEVELING SUPPORT CLIP

Robert J. Menchetti, Buffalo, and Robert M. Chapman, Appleton, both of N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Jan. 23, 1987, Ser. No. 6,187
Int. Cl.[4] E04B *2/82*
U.S. Cl. 52—126.1 **20 Claims**



1. A panel leveling support clip comprising a small elongate strip of relatively rigid sheet metal having a downwardly protruding hump, for providing a floor engaging pivot point, and two outwardly directed panel supporting plates, affixed one to each end of said hump, for providing a panel bottom edge supporting surface, said clip further having means for holding said clip in a desired position below a panel as said panel is being adjusted vertically into a desired vertical extent.

4,700,516

COMPOSITE, PRE-STRESSED STRUCTURAL MEMBER AND METHOD OF FORMING SAME

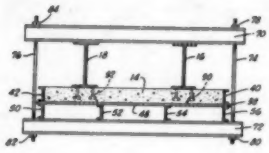
Stanley J. Grossman, Norman, Okla., assignor to Keith and Grossman Leasing Company, Norman, Okla.

Division of Ser. No. 324,980, Nov. 25, 1981, Pat. No. 4,493,177. This application Jan. 2, 1985, Ser. No. 688,272
The portion of the term of this patent subsequent to Jan. 15, 2001, has been disclaimed.
Int. Cl.[4] E04C *3/26, 3/294;* B28B *9/04*
U.S. Cl. 52—223 R **17 Claims**

6. A composite, pre-stressed structural member comprising:

a molded upper surface formed of hardened concrete; and

a lower metal support member extending beneath and connected by shear connection means to said molded upper surface for supporting loads placed upon said molded upper surface, said connection between said molded upper surface and said lower metal support having a shear stress



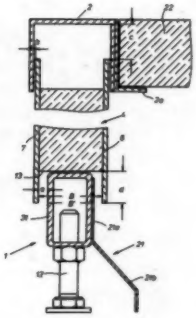
load thereon formed by hardening said concrete about said shear connection means with said lower metal support member deflected by the weight of said concrete and said lower metal support in an inverted stress position.

4,700,517

CABIN-LIKE COVER

Albert Stöhr, am Wiegenberg, Fed. Rep. of Germany, assignor to Gebr. Hennig GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 805,966, Dec. 5, 1985, abandoned. This application Nov. 17, 1986, Ser. No. 931,673
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446036; Apr. 22, 1985, 8511949[U]
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—241 **10 Claims**



1. A cabin-like cover assembly for covering machines and the like comprising

(a) a horizontally extending base frame (1),

(b) a horizontally extending top frame (2) positioned in alignment with and vertically above said base frame and including an inverted U-shaped cross section,

(c) a plurality of self-supporting rectangular vertically extending panels (4) which form the side walls of the cabin-like cover, the upper edge portions of each of said panels engaging with said top frame (2), and the lower edge portions of each of said panels engaging with said base frame (1) and the side edges of at least some of said panels engaging with the side edges of the adjacent panels, characterised in that

(d) said base frame (1) contains at least one horizontally extending base frame beam (31) of box-shaped cross-section,

(e) said panels (4) each having their lower edges (13) formed in a U-shaped cross-section which faces downwardly and has two dependent legs that straddle and extend downwardly from a central section, said dependent legs defining an internal breadth (B) which is at least as great as the

external breadth (B') of the base frame beam (31) and said central section engages and is supported upon the base frame beam with both legs of the U-shaped cross-section straddling over the base frame beam (31) and wherein the upper edge portion and the lower edge portion of the panels (4) have sufficient clearance (b,a) relative to the top frame (2) and the base frame (1) respectively for the panels to be raised and tilted and laterally removed from the frame; and

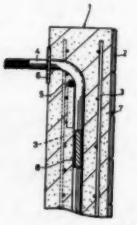
(f) closure elements (5) positioned between some of the adjacent ones of said vertically extending panels with the outer surfaces of each of said closure elements being substantially flush with the outer surfaces of said adjacent ones of said vertically extending panels.

4,700,518

CONCRETE PANEL HAVING TILE DRIVEN

Shigeyuki Akihama, Chofu; Makoto Saito; Akio Kawamoto, both of Tokyo; Tadashi Banno, Chofu; Yoshihiko Umeki, and Takumi Nakamura, both of Tokyo, all of Japan, assignors to Kajima Kensetsu Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 528,339, Aug. 31, 1983, abandoned. This application Sep. 19, 1985, Ser. No. 778,723
Claims priority, application Japan, Sep. 3, 1982, 57-153671
Int. Cl.[4] E04C *1/00*
U.S. Cl. 52—309.16 **10 Claims**



1. In a building panel comprising a body of concrete and pre-attached tiles providing a finished surface on said concrete, the improvement comprising: said body of concrete including reinforcing carbon fibers therein and reinforcing iron materials embedded therein, said carbon fibers having extremely low drying shrinkage ratio and high dimensional stability effectively preventing cracking and exfoliation of said tiles, and said reinforcing iron materials being electrically isolated from the said carbon fibers and protected from the corrosion promoting electroconductive action thereof by a layer of material on said iron materials having a thickness providing an electrical resistance above 100 ohms.

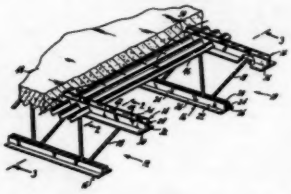
4,700,519

COMPOSITE FLOOR SYSTEM

Joel I. Person, 19 Rosalie Pl., Commack, N.Y. 11725, and Atle Gjelsvik, Tappan, N.Y., assignors to Joel I. Person, Commack, N.Y.

Continuation of Ser. No. 630,965, Jul. 16, 1984, Pat. No. 4,592,184. This application Apr. 17, 1986, Ser. No. 854,112
Int. Cl.[4] E04B *1/16, 5/19*
U.S. Cl. 52—334 **6 Claims**

1. A composite concrete floor system comprising a plurality of metal joists, said joists having a top chord, a bottom chord and a web comprising tension and compression members in the space between the top and bottom chords and secured to said top and bottom chords, the top of said web being secured to the lower surface of sid top chord, said top chord having two horizontal legs and a vertical leg having a lower end and an upper end, deformations formed in the vertical leg between the upper and lower ends thereof such that there is no decrease in the height of the vertical leg along its length, said deformations extending laterally outwardly from said vertical leg, metal decking material supported between the horizontal legs of the top chords of adjacent joists, a concrete slab formed over the metal decking and the top of the joist in which the top chord is embedded with the deformations extending into said concrete slab, reinforcing mesh embedded in said concrete slab such that axial forces on said top chord which cause said deformations to act as wedges tending to split the concrete slab are counteracted by transverse restoring forces created by the reinforcing mesh.

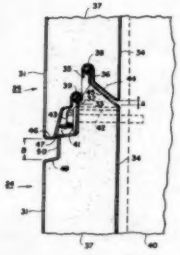


4,700,520

SIDE JOINT OF COMPOSITE METAL PANEL

Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237

Filed Jun. 23, 1986, Ser. No. 877,304
Int. Cl.[4] E04C *1/10, 2/20;* **E04D** *1/34*
U.S. Cl. 52—478 **10 Claims**



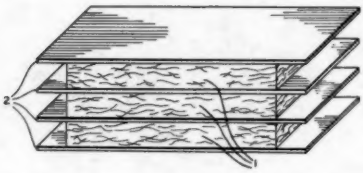
1. In a building panel wall assembly formed from individual building panels, each panel having an outer metal facing sheet, an inner metal facing sheet and a structural core adhesively connecting said metal sheets, wherein said outer facing sheet and said inner facing sheet have lateral profiled joint-forming surfaces for connecting a pair of said panels in side-by-side relation to a building frame, the panel depth being the distance between said facing sheets; the improvement comprising said outer and inner facing sheets of said panel being reversely bent on one side of said panel and each terminating in an integral reversely bent female joint, said outer and inner facing sheets of said panel being offset inwardly and each terminating in an integral male joint on the other side of said panel, which male joints are positioned to interfit with said female joints, a fastener extending through both said outer and inner facing sheets and in the vicinity of said male joints for fastening both of said male joints to a wall panel support, said reversely bent outer facing being extended sufficiently to conceal from view said male and female joints and said fastener.

4,700,521

MULTILAYERED INSULATION BATT FOR BUILDING STRUCTURES

Craig H. Cover, 344 Wrights Rd., Newtown, Pa. 18940

Filed Apr. 28, 1986, Ser. No. 856,197
Int. Cl.[4] E04B 1/47
U.S. Cl. 52—404 6 Claims



1. In a building structure, thermal insulation located within said building walls, ceilings or floors, the improved insulation, comprising;

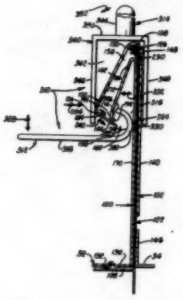
a unitary composite batt of thermal insulation consisting of multiple sections, each section comprising a layer of partially solid low heat-conductive material and a sheet of low emissivity material on at least one side, said composite batt containing at least three of said sections but not more than eight sections laminated together wherein said layers of low heat conductive material have a depth in the range of 0.25 inches to 2.0 inches.

4,700,522

STANDING SEAM SIDELAP SYSTEM AND METHOD FOR ASSEMBLING SAME

Harold S. Simpson, Oklahoma City, Okla., assignor to Harold Simpson, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 425,477, Sep. 28, 1982, Pat. No. 4,497,151. This application Apr. 4, 1983, Ser. No. 481,844
Int. Cl.[4] E04D 1/00
U.S. Cl. 52—528 15 Claims



1. A method for enhancing joint integrity of a seam formed by union of adjacently disposed panels wherein one of the panels is provided with a female member having an upstanding first leg member, a spatially disposed downwardly extending second leg member and a lip member, the first leg member, the second leg member and the lip member cooperating to form a male receiving cavity, and wherein the other panel is provided with a male member having an upstanding third leg member, a spatially disposed downwardly extending fourth leg member and a lip engaging member, the method comprising:

inserting the male member into the male receiving cavity of the female member such that the lip engaging member of the male member can be forced into engagement and is supported by the lip member of the female member; and

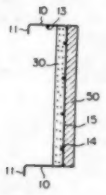
applying a force to the downwardly extending fourth leg member of the male member such that the lip engaging member of the male member slidably moves along the lip member of the female member in a direction away from the upstanding first member of the female member and the third leg member of the male member and urges the male member into a proper union with the female member.

4,700,523

REINFORCING FRAME WORK FOR CONSTRUCTING REINFORCED CONCRETE STRUCTURE

Soichiro Kohara, Saitama, Japan, assignor to Fujikigyo Co., Ltd., Japan

Filed Dec. 26, 1985, Ser. No. 813,664
Claims priority, application Japan, Dec. 28, 1984, 59-278679
Int. Cl.[4] E04B 2/00
U.S. Cl. 52—565 2 Claims



1. A frame work for use in constructing a steel reinforced concrete wall structure and comprising; laterally spaced inner and outer wall elements (30, 30) of light weight insulating board material, said wall elements arranged parallel to one another and extending longitudinally to define a wall of length B, and extending vertically to define a wall height equal to an even multiple of height A, and having outer surfaces that are so spaced from one another as to define a wall thickness C, longitudinally extending steel bar elements (14, 14) provided adjacent the outer surface of said wall elements, said bar elements being arranged generally parallel to one another, longitudinally spaced steel frame units also provided adjacent the outer surfaces of said wall elements and cooperating with said steel bar elements to define an open grid, each frame unit including at least two oppositely disposed generally U-shaped steel frame unit defining elements (15, 15) each said frame element having leg portions (10, 10) of length equal to or greater than C/2, said leg portions spaced vertically by a dimension A each frame element having an elongated base portion that is provided adjacent said wall element outer surface, each frame element leg portion having an end portion defining a down-turned hook (11, 11), said leg end portions of said two frame unit defining elements overlapping one another intermediate said wall elements, and longitudinally extending steel guide bars (16, 16) secured at longitudinally spaced locations to said overlapped leg end portions.

4,700,524

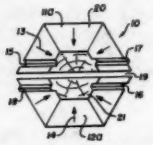
TONGUE AND GROOVE TAPERED PLANKS

Barrie D. G. Addison, 6180 Tisdall Street, Vancouver, British Columbia, Canada (V5Z 3N4)

Filed Jul. 24, 1986, Ser. No. 889,120
Int. Cl.[4] E04C 1/04
U.S. Cl. 52—593 15 Claims

1. A finished construction plank processed from a log having sides chipped to an hexagonal profile to form tapered flattened surfaces along the longitudinal length of the log, said log being cut to form a top and bottom half each having a saw cut surface, each of said top and bottom half thereby forming a plank

which is tapered along the width and depth dimensions and wherein each plank is cut with at least one of a tongue and groove on each side extending parallel said saw cut surface along the longitudinal length of said plank.

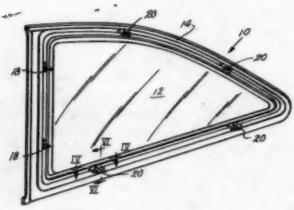


4,700,525

MOLDED PANEL ASSEMBLY AND FASTENERS THEREFOR

Keith A. Nieboer, Holland, and Herbert D. Tucker, Rochester, both of Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Apr. 16, 1986, Ser. No. 852,416
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—698 **59 Claims**



1. A fastener for securing a panel assembly such as a vehicle window assembly or the like to a support, said fastener adapted for embedding in a molded portion of the panel assembly and comprising:

a base having opposite sides;

resilient means on one side of said base for engaging a rigid member in the panel assembly to urge said base into sealing contact with a mold portion during formation of the molded portion of the panel assembly and for retaining said fastener in the molded portion of the panel assembly;

attachment means on the opposite side of said base for securing the fastener and the panel assembly to a support;

said base also having portions extending outwardly beyond and around said attachment means, said extending base portions including a surface adjacent said attachment means which is adapted to sealingly engage a mold portion during formation of the panel assembly to prevent the flow of molding material around said attachment means.

4,700,526

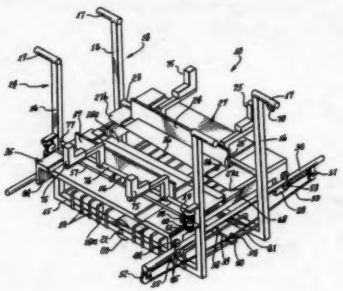
ROOFING SHINGLE SEPARATING AND LAYING MACHINE

Mario F. McGuinness, 7519 Ponce Ave., Canoga Park, Calif. 91304

Filed Jan. 12, 1987, Ser. No. 2,747
Int. Cl.[4] E04D *15/02*
U.S. Cl. 52—749 **15 Claims**

1. Roofing apparatus comprising:

(a) a longitudinally elongated blade having a laterally presented sharp edge section adapted to initially penetrate between two stacked shingles, and a laterally presented thickned edge section adapted to spread the two shingles as the blade further penetrates laterally therebetween,



(b) and means to separate one of the two relatively spread shingles from the other by movement of the one shingle in a direction generally parallel to the other.

4,700,527

CONCRETE MASONRY BLOCK WALL CLADDING CONSTRUCTION SYSTEM AND BLOCKS FOR SAME

Jorge Pardo, Reston, Va., assignor to National Concrete Masonry Association, Herndon, Va.

Continuation-in-part of Ser. No. 570,684, Jan. 13, 1984, abandoned. This application Aug. 29, 1985, Ser. No. 771,499
Int. Cl.[4] E04B *2/72*
U.S. Cl. 52—763 **32 Claims**

1. A concrete masonry block veneer wall cladding construction for a building comprising

a substrate exterior wall;

support means anchored to said substrate wall and extending generally horizontally along said wall;

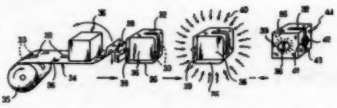
a plurality of elongated battens secured to said substrate wall at laterally spaced intervals and extending generally above said horizontally extending support means;

a column of concrete masonry veneer blocks vertically supported by said horizontally extending support means with portions of said CM blocks secured to adjacent laterally spaced battens so that CM blocks are mounted on said substrate wall, said column of blocks being defined by plural courses of blocks stacked on said support means.

4,700,528
HEAT SHRINK PACKAGE HANDLE

Emile C. Bernard, Rueil Malmaison, France, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 7, 1985, Ser. No. 785,073
Claims priority, application France, Oct. 12, 1984, 84 15652
Int. Cl.[4] B65B *21/24, 61/14*
U.S. Cl. 53—398 10 Claims



1. A method for packaging at least one article in heat shrinkable film while forming at least one handle for carrying the resultant package, said method comprising the steps of:

bonding a length of tape along its entire length to a sheet of heat shrinkable material;

weakening portions of the sheet along central portions of the longitudinal edges of the tape;

wrapping the article in the sheet of heat shrinkable material with the bonded tape positioned on one of the exterior or interior of the sheet and the central portion of the tape at a location relative to the article at which the handle is desired;

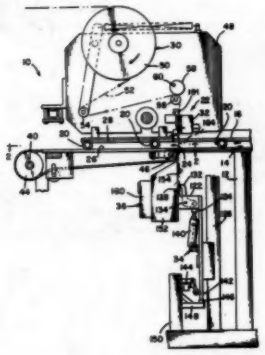
sealing two opposite ends of the sheet together; and

heating the sealed sheet to a temperature sufficient to shrink the sheet onto the article after said weakening step so that openings are caused through the weakened portions of the sheet along the central portions of the tape which then provides the handle, which openings have substantial widths in directions normal to the longitudinal edges of the tape to afford easy access to the handle.

4,700,529
ROLL BANDING MACHINE AND METHOD

William E. Bargholtz, and Robert E. Molison, both of Hanover, Pa., assignors to Elsner Engineering Works, Inc., Hanover, Pa.

Filed Feb. 20, 1987, Ser. No. 17,086
Int. Cl.[4] B65B *11/04, 13/16*
U.S. Cl. 53—399 16 Claims



1. A roll banding machine including

(a) Conveying means for moving a roll along a path and through a wrapping zone; and

(b) A roll wrapping assembly for wrapping a segment of self-adherent film around a roll as the roll is moved through the wrapping zone, the assembly including:

(i) A film cut off on one side of the wrapping zone operable to sever a length of film from a supply of film to form a film segment,

(ii) A first film clamp located between the film cut off and the wrapping zone operable to clamp one end of a film segment extending into the wrapping zone,

(iii) Film retention means located on the other side of the wrapping zone across from the first film clamp for holding the other end of a film segment in place so that the segment extends across the wrapping zone between the film clamp and the retention unit in the path of movement of the roll through the zone and permitting withdrawal of the film as the segment is wound onto the roll,

(iv) Film feed means extendable across the wrapping zone between the film cut off and the film retention means for engaging the end of a length of film at the film cut off and pulling the film across the wrapping zone and into engagement with the film retention means,

(v) Film feed release means for opening the film clamp and releasing the one end of the film segment after initial wrapping of the other end of the segment around a roll moving through the wrapping zone,

(vi) Rotating means for rotating a roll moving downstream through the wrapping zone, and

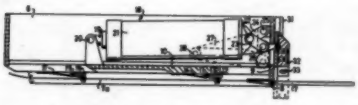
(vii) Holding means for holding the film against the roll during wrapping,

whereby the roll rotates through the wrapping zone, engages the film segment extending across the zone, wraps the film segment around the roll as film is withdrawn from the retention unit and, upon opening of the film clamp, wraps the withdrawn film around the freed one end of the film segment to form a self adherent film band wound around the roll.

4,700,530
METHOD AND DEVICE FOR PLACING EDGE PROTECTING MEANS AT PRESSURE-SENSITIVE EDGES ON OBJECTS

Helmer L. Norberg, Sundsbruk, Sweden, assignor to Dendro Maskin DM AB, Stockholm, Sweden

PCT No. PCT/SE85/00232, § 371 Date Feb. 4, 1986, § 102(e) Date Feb. 4, 1986, PCT Pub. No. WO86/00057, PCT Pub. Date Jan. 3, 1986
PCT Filed Jun. 3, 1985, Ser. No. 834,268
Claims priority, application Sweden, Jun. 13, 1984, 8403172
Int. Cl.[4] B65B *13/06, 13/18*
U.S. Cl. 53—410 9 Claims



1. A method for placing edge protecting means at pressure-sensitive edges on objects, said method comprising the steps of: forwardly feeding in the form of a continuous band (*7a*) successive blanks for edge protecting means (7); subjecting said band (*7a*) during its forward feed to a preliminary bending around a longitudinal line; cutting off a fed-out portion of said band (*7a*) to form an edge protecting means (7) when said fed-out portion is in a correct position; and subjecting said edge protecting means (7) to a final bending simultaneously with the cutting and separation of said edge protecting means (7) in order to give said edge protecting means a shape which is adapted to an edge intended to be protected.

4. A device for placing edge protecting means at pressure-sensitive edges on objects, said device comprising: a body (6); a magazine fixed to said body and carrying a continuous band

(7*a*) for successive blanks for edge protecting means; an arrangement (8–17) for feeding said band, said arrangement being also carried on said body (6), said arrangement further comprising an angular slot (8) through which said band (7*a*) is fed for achieving a preliminary bending of said band (7*a*) around a longitudinal bending line; a cutting means (30) which is also secured to said body (6) such that after said band (7*a*) is fed forward a predetermined distance, said cutting means (30) separates said fed-out portion of said band to obtain an edge protecting means (7); and a bending means (32) arranged to perform simultaneously with said separation of said band by said cutting means a final bending of said edge protecting means (7) so as to give it a shape which is adapted to an edge intended to be protected.

4,700,531

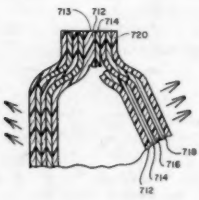
METHOD OF FORMING A PACKAGE HAVING STRONG SEALS AND A MODIFIED PLY-SEPARATION OPENING

Joseph C. Hsu, Neenah, and Anthony C. Guckenberger, Appleton, both of Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 632,701, Jul. 20, 1984, Pat. No. 4,615,926. This application Jan. 16, 1986, Ser. No. 819,339

Int. Cl.[4] B65B *61/18*

U.S. Cl. 53—412 **7 Claims**



1. A method of opening a package to the outside environment for accessing product in the package, wherein the materials and method of constructing the package contribute to enablement of the opening method and its function, said package comprising, as a packaging material, a multiple layer sheet material, said method comprising the steps of:

(a) constructing said sheet material with a peelable interface between two of said layers;

(b) positioning said sheet material in closure relationship to make a package;

(c) forming said package, and closing and sealing said package with seals between adjacent packaging element members, the force required to peel apart said seals being greater than the force required to tear partially through said sheet material to said interface and to separate said two layers by ply separation; and

(d) applying outwardly directed forces on opposite sides of said closed and sealed package at locations inward of said seals thus applying force directed toward separating the sides of said package at said seals;

(e) tearing said sheet material from the inner layer outwardly partially through said sheet material to said peelable interface;

(f) progressing said tear along said peelable interface to the outer edge of said package to peel apart said sheet material;

steps (d), (e) and (f) functioning to open said package for access to the contents thereof from the outside.

4,700,532

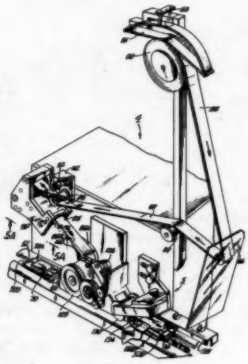
METHOD AND APPARATUS FOR MAKING COMPACT PACKAGES FOR SPREADABLE PRODUCTS

Sanford Redmond, 746 Riverbank Rd., Stamford, Conn. 06903

Filed Oct. 3, 1986, Ser. No. 915,182

Int. Cl.[4] B65B *3/02*

U.S. Cl. 53—452 **17 Claims**



1. A method for high speed continuous and uninterrupted production of rigid unitized packages for storing, shipping and handling an individual service portion of a spreadable product and for supporting said spreadable product for use after opening said packages, comprising the steps of:

(a) cutting a continuous supply of relative stiff material into individual substantially flat base cards of predetermined length;

(b) forming parallel score lines adjacent two opposed edges of each of said base cards;

(c) bending the scored edges of said base cards approximately perpendicular to the intermediate portion thereof to form a channel-shape configuration;

(d) reopening the channel sides of said base and reforming said base card to a substantially flat configuration;

(e) depositing an individual service portion of a spreadable product onto the substantially flattened, pre-scored base card between said score lines;

(f) forming a continuously moving web of relatively thin flexible material;

(g) forming parallel score lines adjacent the opposed edges in said web thereof spaced apart a distance approximately equal to the score lines in said base cards;

(h) folding the scored web edges onto said web and pressing the folded edges flat;

(i) reopening the folded web edges and returning the web to a substantially flat configuration;

(j) continuously cutting the pre-creased web into successive individual pre-creased sheets of predetermined length;

(k) substantially instantaneously after cutting, accelerating said individual pre-creased sheets away from the cut web and depositing said pre-creased sheets onto successive individual service portions of a spreadable product carried by said base cards;

(l) rolling and bending said pre-creased sheet into adhering contact with the top and two opposed sides of said spreadable product, said pre-creased sheet thereby forming a channel-shaped cover member about the top of said spreadable product; and

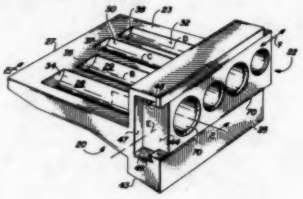
(m) bending the channel sides of said pre-bent base upwardly into adhering contact with said spreadable product and overlapping contact with the outer surfaces of the top cover channel sides, said pre-scored base thereby forming a channel-shaped cover member about the bottom of said spreadable product.

4,700,533

DEVICE FOR STACKING AND WRAPPING COINS

Frank L. Green, 9026 N. 128th St., Scottsdale, Ariz. 85259

Filed Aug. 7, 1986, Ser. No. 894,005
Int. Cl.[4] B65B *9/10, 67/02*
U.S. Cl. 53—532 24 Claims



1. A device for receiving and stacking a predetermined number of coins of selected denomination and for holding a tubular wrapper for receiving said coins, said device comprising:

a. first means for receiving and stacking coins of selected denomination; and

b. second means movably carried by said first means for holding a tubular wrapper and selectively positionable between

i. a first position for limiting said first means to receiving a predetermined number of coins; and

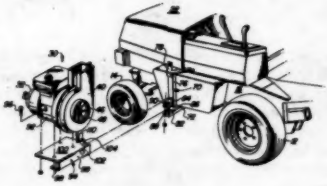
ii. a second position for transfer of said predetermined number of coins to said tubular wrapper.

4,700,534

BLOWER ATTACHMENT

Roger D. Reilly, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.

Filed Aug. 7, 1986, Ser. No. 894,179
Int. Cl.[4] A01D *34/82, 34/63*
U.S. Cl. 56—13.3 7 Claims



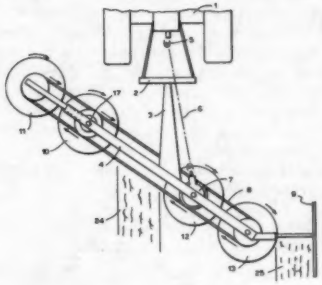
1. Mounting structure for supporting a power module on the side of a tractor having a main frame comprising: a subframe detachably mounted on the tractor frame and extending transversely outwardly from the tractor toward the module, said subframe having vertically aligned and vertically spaced horizontal ledges thereon; a complementary subframe fixed to the module and having vertically aligned, transversely extending horizontal platforms that are vertically spaced of the order of the vertical spacing of the ledges, said ledges and said platforms being in transverse overlap positions with respect to each other; matching vertically aligned vertical sockets and vertically aligned vertical pins supported on the ledges and platforms, the combined vertical lengths of each matching socket and pin being less than the vertical spacing between the ledges and platforms whereby each matching socket and pin may be vertically separated to permit said ledges and platforms to move to and from their overlapping positions; and a shear pin spaced from the axis of said sockets and pins and connecting at least one of said ledges to at least one of said platforms to prevent swiveling action therebetween about the axis of said matching sockets and pins.

4,700,535

DRUM-TYPE WINDROWING MACHINE

Ulrich Wessel, Gottmadingen, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG Szeigniederlassung Fahr, Gottmadingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 713,520, Mar. 19, 1985, Pat. No. 4,601,162. This application Apr. 15, 1986, Ser. No. 852,283
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] A01D *55/26, 78/10*
U.S. Cl. 56—13.6 10 Claims



1. In a windrower for forming mown crop material into a swath and adapted to be drawn by a tractor, comprising a transverse support attached to said tractor by a towing bar orientable at an acute angle to a travel direction of said windrower, a plurality of crop-transfer drums attached under said transverse support parallel to each other so as to each be rotatable, said rotary crop-transfer drums being offset from each other in said travel direction of said windrower, the work zones of said rotary crop-transfer drums overlapping, the improvement which comprises means for swinging at least one of said crop-transfer drums through substantially 180° around an upright axis of a neighboring crop-transfer drum with the angle of an axis of the swingable crop-transfer drum with respect to the ground maintained unchanged.

4,700,536

MOWER WITH IMPACT RESISTANT CONNECTION

Robert M. Torras, St. Simons Island, Ga., assignor to Kut Kwick Corporation, Brunswick, Ga.

Filed Apr. 22, 1985, Ser. No. 725,935
Int. Cl.[4] A01D *34/04*
U.S. Cl. 56—15.8 10 Claims

1. In a mower assembly for cutting grass and the like including a self propelled power unit for moving across the ground in a forward direction, a cutter unit positioned in front of said

power unit, and pivot mounting means connecting said cutter unit to said power unit about a pivot axis extending forwardly from said power unit so that the cutter unit is pivotable about said pivot axis with respect to said power unit, the improvement therein of a pair of impact resistant means mounted between said power unit and said cutter unit, said pair of impact resistant means each positioned in an array about said pivot axis, one of said impact resistant means comprising a bearing surface mounted on said power unit and the other of said impact resistant means comprising a bearing surface mounted on said cutter unit, said bearing surfaces of each impact resistant means being aligned with each other and extending in an arc about said pivot axis so that said bearing surfaces are movable with respect to each other about said pivot axis while portions thereof remain in alignment with each other, means for maintaining said bearing surfaces of each impact resistant means in abutment with each other and movable with respect to each other while in overlapped sliding relationship when said power unit and said cutter unit pivot with respect to each other about said pivot axis to either side of leveled orientation, whereby during forward movement of the mower should the cutter unit engage to one side of its pivot axis an obstacle in its path the bearing surfaces of the impact resistant means tend to press against each other on the one side of the pivot axis to resist any turning across the pivot axis of the cutter unit with respect to the power unit.

4,700,537

CROP DIVIDER MOUNTING ARRANGEMENT FOR A HARVESTER

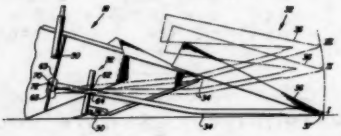
Walter Emmert, Contwig, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Sep. 10, 1986, Ser. No. 906,349

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1985, 85111634

Int. Cl.[4] A01D *63/00*

U.S. Cl. 56—314 **18 Claims**



1. In a harvesting machine having a forwardly disposed transversely extending crop gatherer movable between a lower operating position and an upper transport position, and including a frame with opposite ends and a forwardly extending crop divider carried by at least one of the frame opposite ends, the divider riding on the ground when the gatherer is in the operating position and having a frame including an elongated generally fore-and-aft extending spine having a fore-and-aft axis and carrying a forwardly extending generally conical divider point for dividing crop to be gathered from adjacent crop, a divider support arrangement for the divider comprising:

a fore-and-aft extending guide carried by the frame adjacent the at least one opposite end for receiving the spine and defined, at least in part, by spaced apart forward and rearward apertures, the divider being disposed so that the spine passes through the apertures and the apertures being sized so that, responsive to external forces on the divider point, the spine may move in the guide in translational, rocking or pivoting motion in a fore-and-aft upright plane.

4,700,538

METHOD AND APPARATUS FOR HANDLING A SLIVER

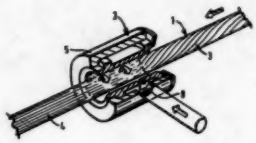
Andre Varga, Toronto, Canada, and Henry Cripps, Stockport, England, assignors to Carding Specialists Ltd, Toronto, Canada

Filed Aug. 15, 1985, Ser. No. 766,034

Claims priority, application United Kingdom, Aug. 17, 1984, 8421020

Int. Cl.[4] D01G *23/08;* **D01H** *5/28, 7/92, 11/00*

U.S. Cl. 57—90 **11 Claims**



1. A method of handling a silver, comprising continuously applying mechanical tension to the sliver for taking the sliver from a first piece of sliver storage or processing equipment and for causing the sliver to travel a substantial distance into the control of a spaced second piece of sliver storage or processing equipment, and continuously directing a stream of gas toward the silver intermediate the first and second pieces of equipment for continuously pneumatically forming a false twist in the sliver for increasing the strength and cohesion of the sliver during its travel between the first and second pieces of equipment by effecting a temporary increase of interfiber friction in the sliver and for simultaneously removing impurities from the sliver, without said stream of gas contributing substantially to movement of the sliver in longitudinal direction.

7. Apparatus for handling a sliver, comprising a first piece of sliver storage or processing equipment, a second piece of sliver storage or processing equipment spaced a substantial distance from said first piece of equipment, means defining a path of travel for said sliver between said first and second pieces of equipment, means for continuously applying mechanical tension to the silver to cause it to travel along said path and means for temporarily increasing the strength and cohesion of the sliver during its travel between the first and second pieces of equipment, said means comprising a false twister device arranged along said path of travel for continuously subjecting the sliver to a false twisting process in order to effect a temporary increase of interfiber friction in the sliver, said false twister device comprising pneumatic means for supplying a gas under pressure to the sliver for imparting a temporary twist to the sliver and for simultaneously cleaning the sliver without contributing substantially to movement of the sliver in longitudinal direction.

4,700,539

OPEN-END SPINNING DEVICE

Karl Handschuch, Gaimersheim, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jul. 1, 1986, Ser. No. 880,689

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3524313

Int. Cl.[4] D01H *7/882, 7/885, 1/135*

U.S. Cl. 57—401 **19 Claims**

1. An open-end spinning device, comprising:

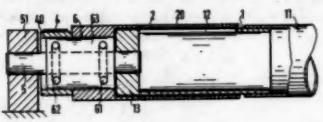
a pair of friction rollers operatively associated to define a spinning nip;

at least one of said rollers being provided with a perforated casing so as to embody a suction roller;

a suction insert, having a suction orifice therein, disposed within said suction roller and adapted for connection to a suction source; and

a support shaft with a rotatable bearing received about a

longitudinal portion thereof, said roller bearing supporting one axial end of said suction roller perforated casing with the other axial end of said casing being unsupported, and said shaft terminating in one axial end of said suction insert; and wherein



said suction insert is located directly behind said perforated casing, and has a constant cross-section along its entire longitudinal axis so as to provide a uniformly maximized suction cross-section with the smallest possible diameter suction roller perforated casing.

4,700,540

COLLAPSIBLE SELF-RECOVERING CYLINDER DISCRETE IMPULSE MOTOR

Baney L. Byrum, 34-B Fenway South, Baltimore, Md. 21221

Filed Jan. 16, 1985, Ser. No. 691,873
Int. Cl.[4] F04B *17/00*
U.S. Cl. 60—325 **10 Claims**

1. A positive displacement pump comprising:

a reservoir of fluid, said fluid to be pumped to another location R′, compatible with the pressure p that can be developed at the pump where it is to be discharged from the loop against pressure p″;

a conduit C′ filled with said fluid and leading from said reservoir through a nonreturn valve V_R, located within the fluid of said reservoir, to a nonreturn valve V_k which opens into E_k, an adjunct of C′, comprising a container with a collapsible wall having length less than the minimum distance between train wheel axles, width less than the distance between train rails, interior vertical dimension comparable to train wheel flange height, overall vertical dimension less than train rail height, and resilience e, and being externally exposed to static pressure p'_a;

said E_k filled with said fluid at a static absolute pressure p_o, where $p_a' - p_e < p_o \leqq p''$ for $0 \leqq p_e \leqq p'_a$ and $0 \leqq p_o \leqq p''$ for $p_e > p'_a$, p_e denoting the outward pressure equivalent of said resilience e;

said E_k emplaced between the two rails of the train track separate from either rail;

said E_k having suitable means for eliminating vapor if said fluid is a liquid;

said V_R having means and position with respect to said V_k compatible with fluid supply thereto at said pressure p_o;

at least a portion of the exterior wall of said E_k being engageable by any given wheel flange of a passing train for a finite interval of time thereby causing, via its impulse delivery, a loss of volume in E_k, the corresponding loss of fluid from E_k comprising pump displacement;

said flange causing an applied force $\bar{F} = -\hat{u}F$ at least a portion of which deforms a portion of E_k having surface area S in contact with said fluid in E_k thereby causing dynamic absolute pressure $\bar{p} = np$ to develop in E_k such that the fluid-contributed portion f of the reaction to said applied force is approximately given by

$$f = \int_S \int (p - p'_a + p'_e)\, n \cdot u \, dS$$

where f is at least a portion of F, the reaction to the difference between f and F being balanced by means other than fluid pressure, û and n are unit vectors along the line of action of $\bar{F}$ and along the normal to S, respectively, being taken as positive when drawn outward from S, and p, S, û and n may be functions of position and time;

said E_k and said impulse being sufficient size, and said E_k and said means of impulse delivery being geometry, engagement means, and safety features such that during said impulse said pressure p in E_k while not becoming too large becomes large enough to cause sustained flow of a quantity of fluid out of E_k through a non-return valve V'_k into and through a conduit C″ to said station R′ at which said pressure p developed at the impulse-producing station of E_k has been reduced by lost head between stations to p′ which is greater than said p″; and

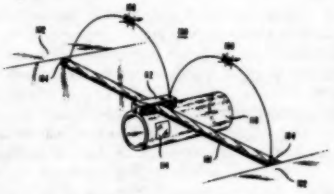
motion of the train removing said flange so that said loss of volume in E_k can be recovered resiliently and by net outward fluid pressure on the inner wall surface of E_k, said quantity of fluid flowing out of E_k through nonreturn valve V'_k being replaced by an equal amount flowing in through said non-return valves V_R and V_k, and the cycle of deformation and recovery of E_k continued in an arbitrary time sequence of discrete impulses where the time interval between successive impulses is greater than the recovery time of E_k.

4,700,541

SHAPE MEMORY ALLOY ACTUATOR

Kaigham J. Gabriel, Fair Haven; William S. N. Trimmer, Belle Mead, and James A. Walker, Howell, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 16, 1986, Ser. No. 919,788
Int. Cl.[4] F03G *7/06*
U.S. Cl. 60—528 **18 Claims**



1. An actuator comprising:

a wire made of a shape memory alloy, the wire being torsioned about its longitudinal axis and the ends of the wire being fixed to a support structure;

a control member attached to the wire at a prescribed point; and

a plurality of electrical connections to different longitudinal sections of the wire to which voltages may be selectively applied, thereby to rotate the wire and control element.

4,700,542

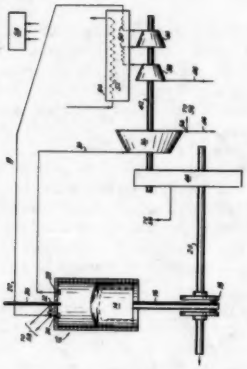
INTERNAL COMBUSTION ENGINES AND METHODS OF OPERATION

Lin-Shu Wang, 21 Hawks Nest Rd., Stony Brook, N.Y. 11790

Continuation-in-part of Ser. No. 652,701, Sep. 21, 1984, Pat. No. 4,610,141. This application Aug. 21, 1986, Ser. No. 898,967

Int. Cl.[4] F02B *37/10, 71/04;* F02C *7/057*

U.S. Cl. 60—598 17 Claims



1. The method for the operation of an internal combustion engine having means in which an air-fuel input of variable ratio is combined and ignited to produce a high temperature and pressure exhaust gas stream, comprising the steps of:

(a) directing the exhaust gases through expansion means to extract work therefrom;

(b) monitoring on a continuing basis the air-fuel ratio and the temperature of said exhaust gases after exiting from said expansion means;

(c) continuously comparing the temperature of said exhaust gases to predetermined standards representing given high values of engine efficiency at the air-fuel ratios to create a control signal relating to said difference; and

(d) continuously variably compressing the input air of said air-fuel mixture in response to said control signal

such that said exhaust gas temperature is maintained at said predetermined standard during engine operation.

7. An improved internal combustion engine comprising:

means for producing a high temperature and pressure exhaust gas stream from an air-fuel input mixture said production means comprising air and fuel input means;

output means coupled to said exhaust gas production means for extracting output work from said exhaust gas stream;

variable compressor means drive coupled to said exhaust gas production means for varying the pressure of the air portion of the input air-fuel mixture, said compressor means having an air input and an output coupled to said air input means;

sensing means adapted and arranged for continuous monitoring of the temperature of said exhaust gas stream after passing through said output means and for monitoring the input air-fuel ratio at said air and fuel input means;

and means for providing a continuous control signal for varying the compression of the input air by said variable compressor means based upon the temperature difference between the monitored temperature of said exhaust gas stream and a predetermined reference temperature for a given sensed air-fuel ratio such that said monitored exhaust gas temperature is continuously maintained at said predetermined reference temperature during engine operation, said predetermined reference temperature corresponding to a predetermined engine efficiency at a given air-fuel ratio.

4,700,543

CASCADED POWER PLANT USING LOW AND MEDIUM TEMPERATURE SOURCE FLUID

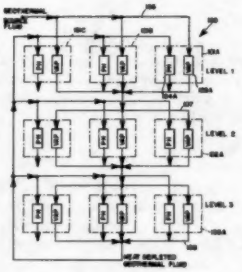
Zvi Krieger, Tel Aviv, and Alex Moritz, Holon, both of Israel, assignors to Ormat Turbines (1965) Ltd., Yavne, Israel

Continuation-in-part of Ser. No. 631,058, Jul. 16, 1984, Pat. No. 4,578,953. This application Dec. 27, 1985, Ser. No. 813,724

The portion of the term of this patent subsequent to Apr. 1, 2003, has been disclaimed.

Int. Cl.[4] F01K *23/02*

U.S. Cl. 60—655 10 Claims



1. A power plant operating on a source of low or medium temperature fluid comprising:

(a) a plurality of closed Rankine cycle power plant modules each having a vaporizer associated therewith responsive to source fluid for converting operating fluid of the power plant modules to vapor, said modules being arranged in a plurality of levels, each level comprising a plurality of modules;

(b) means for applying source fluid in parallel to each vaporizer in a level to produce heat depleted source fluid, means for applying heat depleted source fluid from a level to each vaporizer in parallel in the succeeding level;

(c) a preheater associated with each vaporizer for preheating operating fluid that is vaporized in the associated vaporizer; and

(d) means for applying heat depleted source fluid from the lowest level to all of the preheaters in parallel.

4,700,544

COMBUSTORS

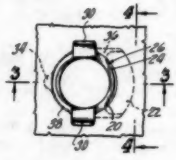
Robert C. Fucci, Jupitor, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 7, 1985, Ser. No. 689,220

The portion of the term of this patent subsequent to Nov. 18, 2003, has been disclaimed.

Int. Cl.[4] F02C *1/00;* F02G *3/00*

U.S. Cl. 60—757 4 Claims



1. For a liner for a combustion chamber of a gas turbine engine having the products of combustion on the inner surface

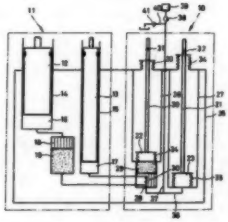
of the liner and cooler air on the outer surface of the liner, means for generating a film of cool air by directing the cooler air internally to flow adjacent the inner surface of the liner, combustion/dilution air holes in said liner flowing cooler air into the combustion chamber impeding said film, refilmer means for generating a film of cooler air downstream of said combustion/dilution hole relative to the flow of the combustion products, said refilmer including a grommet extending through a circular opening formed in said liner and having an outer diameter substantially equal to the diameter of said circular opening, an axially extending lip on one end of said grommet circumferentially extending 180° around said grommet, the outer wall of said grommet contiguous with said lip being recessed to define a gap between the liner and grommet for leading cooler air from the outer surface of said liner to impinge on said lip and form a film of cooler air directed adjacent the inner surface of said liner, means for attaching said grommet to said liner, spacer means on said grommet to space said lip radially from the inner surface of said liner and an opening in said grommet defining said combustion/dilution air hole.

4,700,545

REFRIGERATING SYSTEM

Kiyoshi Ishibashi, Toyota, and Yujiro Ukai, Nagoya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed May 6, 1986, Ser. No. 860,034
Claims priority, application Japan, May 6, 1985, 60-95741
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—6 **5 Claims**



1. A refrigerating system for generating low temperatures, comprising:

one high-temperature region refrigerator sub-system and one low-temperature region refrigerator sub-system;

said low-temperature region refrigerator sub-system having at least one compression space and at least one expansion space;

said at least one compression space being defined inside a first bellows;

said at least one expansion space being defined inside a second bellows;

reciprocating means operatively associated with a power source for expanding and contracting said first and second bellows to volumetrically expand and volumetrically contract said compression space and said expansion space;

a first working medium provided in said low-temperature region refrigerator sub-system for being compressed by said at least one compression space by volumetric contraction thereof to produce heat and expanded by said at least one expansion space by volumetric expansion thereof to effect refrigeration;

a second working medium provided in said high-temperature region refrigerator subsystem;

means for thermally coupling said first working medium to said second working medium so that the heat produced by the volumetric expansion of said at least one compression space is transferred to said second working medium;

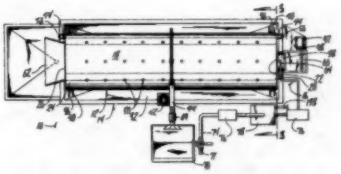
and pressure regulating means for adjusting a maximum pressure of said first working medium in said compression and expansion spaces relative to a critical pressure of said first working medium to cause liquefication of at least some of said first working medium in said at least one expansion space due to refrigeration.

4,700,546

BY-PRODUCT CHILLER AND METHOD FOR USING SAME

Glenn D. Mattson, Chanhassen, Minn., assignor to Omaha Cold Storage Terminals, Omaha, Nebr.

Filed Apr. 28, 1986, Ser. No. 856,469
Int. Cl.[4] F25D *17/02, 25/02*
U.S. Cl. 62—64 **16 Claims**



7. A method of preserving fresh animal by-products which are to be further processed, comprising:

introducing the fresh by-products into a hopper having a top opening and opposite sides, and a plurality of driven blades mounted therein;

mechanically slashing the fresh by-products into sub-divided pieces having increased surface area by moving the by-products into simultaneous engagement with the blades and at least one side wall of the hopper;

introducing slashed warm by-products into an elongated chilling tank at the slaughter vicinity; introducing liquid coolant from a coolant source into said tank;

rotating said tank such that said by-products are tumbled therein for exposure to said coolant whereby heat is transferred from said by-products to said coolant thereby chilling said by-products to eliminate spoilage thereof;

recirculating said coolant to said coolant source for re-cooling thereby whereafter said coolant is reused for chilling additional by-products;

storing the chiller by-products at the slaughter vicinity until said chilled by-products are transported for further processing.

4,700,547

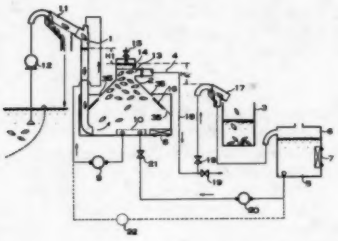
METHOD FOR INSTANTLY KILLING AND COOLING FISH, AND AN APPARATUS FOR CARRYING OUT THIS METHOD

Takeshi Hayashi, No. 85-3, Mitsuicho, Bezaiten, Muya-cho, Nuruto-shi, Tokushima-ken, Japan (772)

Filed Apr. 9, 1986, Ser. No. 849,676
Claims priority, application Japan, Apr. 25, 1985, 60-090586; May 25, 1985, 60-112996
Int. Cl.[4] F25D *13/04, 17/02*
U.S. Cl. 62—65 **15 Claims**

1. A method for instantly killing and cooling fish which comprises a primary or instant cooling stage in which the fish are instantly killed by dipping them into a rapid cooling fluid at a temperature below 0 degree C. and at the same time the body surfaces of the fish are cooled to a temperature below that of the inner portion of the fish, and a secondary or storage stage

at a temperature higher than the freezing point of the fish body in which, after the primary or instant cooling stage, the fish are



kept cool in a temperature above the freezing point of the fish body and above that of the rapid cooling fluid.

4,700,548

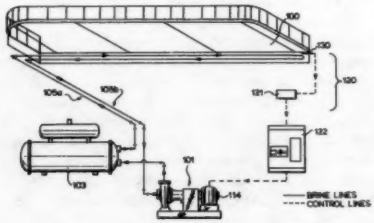
CONTROL APPARATUS FOR ICE RINK REFRIGERATION EQUIPMENT

Richard G. Roche, Milton, and Russell Blades, Burlington, both of Canada, assignors to Ontario, Inc., Burlington, Canada

Filed Mar. 5, 1986, Ser. No. 836,299

Int. Cl.[4] F25D *17/02*

U.S. Cl. 62—139 **10 Claims**



1. A control system for controlling the speed of a centrifugal coolant pump for pumping secondary coolant used in refrigerating an ice slab, comprising:

(a) temperature sensing means embedded in the ice slab for determining ice slab temperature;

(b) control means responsive to the temperature sensing means for generating an output signal correlatable with the ice slab temperature and at least one reference temperature; and

(c) variable speed motor drive means responsive to the control means for varying the speed of the pump from a pre-selected maximum speed to a pre-selected non-zero minimum speed in accordance with the output signal of the control means.

4,700,549

ON-BOARD REFRIGERANT CHARGING SYSTEM

Guido Biagini, Cherry Valley, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 11, 1986, Ser. No. 872,872

Int. Cl.[4] F25B *45/00*

U.S. Cl. 62—149 **9 Claims**

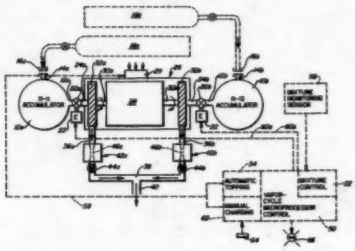
1. An on-board refrigerant charging system for a vapor cycle environmental control system in an aircraft or the like, comprising:

means defining at least a pair of accumulation chambers for holding at least two different refrigerant components, each chamber including an outlet;

selectively operable valve means operatively associated with each outlet;

inlet means to the vapor cycle environmental control system;

pump means in fluid communication with each valve means and said inlet means;



metering means in fluid communication between each pump means and said inlet means;

motor means for driving the pump means; and

control means for sensing refrigerant loss and the component mixture in the control system, and for actuating the motor means to drive the pump means to replace the refrigerant loss and for operating the valve means independently according to the desired component mixture charge.

4,700,550

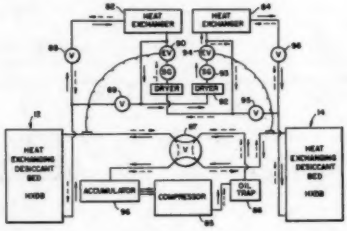
ENTHALPIC HEAT PUMP DESICCANT AIR CONDITIONING SYSTEM

Barry V. Rhodes, Rte. 1, Box 92, Johnston Rd., Chickamauga, Ga. 30707

Filed Mar. 10, 1986, Ser. No. 838,520

Int. Cl.[4] F25D *23/00*

U.S. Cl. 62—271 **13 Claims**



5. An improved desiccant air conditioning system having at least one desiccant bed comprising desiccant material surfaces defining air passageways through the desiccant bed for contacting air passing through the desiccant bed, said desiccant material surfaces adsorbing moisture from building air during an adsorption phase and desorbing moisture into exhaust air during a desorption phase, the improvement comprising:

said at least one desiccant bed comprising a heat exchanging desiccant bed having heat transfer liquid circulatng channels in heat exchange relationship with the desiccant material surfaces of the desiccant bed, said heat transfer liquid circulating channels being operatively coupled to sources of relatively cool liquid and relatively hot liquid for alternatively circulating cooling liquid and heating

liquid respectively in the circulating channels during the adsorption and desorption phases; and

a bypass air duct bypassing said heat exchanging desiccant bed air passageways, and damper means operatively arranged for controlling the proportion of building air passing through the desiccant bed air passageways and the bypass air duct for controlling building air humidity.

4,700,551

SLICE-ICE PRODUCING MACHINE

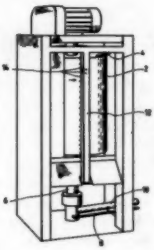
Torsten Nyrup, Humlebaek, Denmark, assignor to Aktieselskabet Thomas Ths. Sabroe & Co., Hojbjerg, Denmark

Filed Jul. 10, 1986, Ser. No. 884,229

Claims priority, application Denmark, Jul. 10, 1985, 3143/85

Int. Cl.[4] F25C *1/14*

U.S. Cl. 62—346 **4 Claims**



1. A slice-ice producing machine comprising a rotary freezing drum, means for supplying water to a drum surface of said rotary freezing drum to cause the water to freeze thereon, a scraper station comprising a knife bar cooperating with the drum surface so as to scrape off the ice by a row of stationary scraper knives projecting almost entirely into contact with the drum surface, generally tangential thereto, though with a slight inclination relative to a moving direction of an adjacent drum surface portion, such that the ice is scraped off generally in the axial direction of the rotary freezing drum, characterized in that at least approximately one-half of the scraper knives are mounted with said slight inclination directed to an opposite side of the inclination of the remaining scraper knives.

4,700,552

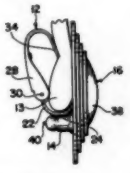
CONVERTIBLE EARRING CONSTRUCTION

Richard J. Haley, Lincoln, R.I., assignor to Quality Jewelry, Inc., Pawtucket, R.I.

Filed Aug. 25, 1986, Ser. No. 900,312

Int. Cl.[4] A44C *7/00*

U.S. Cl. 63—12 **6 Claims**



1. A convertible earring construction comprising a clamping element of substantially U-shaped configuration which is adapted to be received and secured on an earlobe of a wearer; a clutch element secured to the base of said U-shaped clamping element so that when said clamping element is received on said earlobe said clutch element faces outwardly in substantially perpendicular relation to the plane of said earlobe; and a pierced earring element comprising a post which is releasably receivable in said clutch element when said clamping element is secured on said earlobe, and a first decorative portion joined to said post and being displayed in outwardly facing relation adjacent said earlobe when said clamping element is received on said earlobe and said post is received in said clutch element.

4,700,553

YARN TENSIONING DEVICE FOR FLAT KNITTING MACHINES

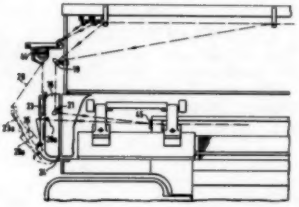
Ernst Goller, Reutligen, and Fritz Walker, Kusterdingen, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Jan. 27, 1987, Ser. No. 6,850

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1986, 3602431

Int. Cl.[4] D04B *15/44*

U.S. Cl. 66—146 R **10 Claims**



1. A yarn tensioning device for flat knitting machines having, for each yarn which is provided for, yarn guide members, at least one yarn brake, and a spring-loaded pivoted lever carrying a yarn guide member and located between two yarn guide members, to serve as take-up tensioner, characterised in that the take-up tensioner (**31/32**) and at least the yarn guide members (**29, 30, 56, 57**) located in front of and behind it in the direction of yarn movement are mounted on a common support (**23**) pivotable out of its operative position for threading up, which has, additionally, behind the take-up tensioner (**31/32**) in the direction of yarn movement, a yarn clamp (**35**) to assist in threading up and to which the yarn (**20**) is led over a yarn guide roller (**19**) stationarily mounted on the machine housing (**14**).

4,700,554

DETERGENT DISPENSER WITH IMPROVED WATER DISTRIBUTION MEANS

Carl E. Eichman, Lincoln Township, Berrien County; Vincent P. Gurubatham, St. Joseph Township, Berrien County; Dennis W. Hauch, Baroda Township, Berrien County, and Garrett K. Kinyon, Watervliet Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 19, 1986, Ser. No. 830,845

Int. Cl.[4] D06F *39/02*

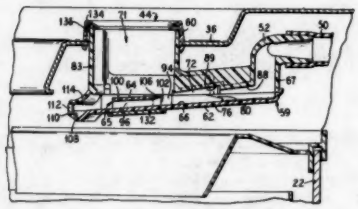
U.S. Cl. 68—17 R **14 Claims**

1. In an automatic fabric washing apparatus having means defining a fabric treatment zone, an improved wash additive dispenser comprising:

a wash additive reservoir having means defining a liquid inlet, a liquid outlet, and a space for receiving a single mass of wash additive to be dispensed;

liquid passage means disposed in fluid flow association with said liquid inlet means and arranged to deliver a first portion of the liquid discharged from said inlet to a region of contact with said additive underneath or within the single mass of wash additive contained in said reservoir

and a remaining portion directly against an exterior surface of the mass of wash additive; and



liquid supply means for supplying a quantity of washing liquid to said inlet means to effect the discharge of said liquid and said additive through said outlet means.

4,700,555

ANTI-THEFT DEVICE

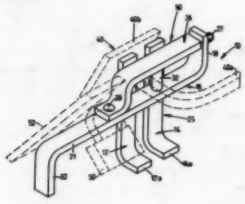
Nathaniel Robertson, Sr., and Nathaniel Robertson, both of 60 Broad Gully Road, Diamond Creek, 3089, Victoria, Australia

Filed May 21, 1986, Ser. No. 865,304

Claims priority, application Australia, May 21, 1985, PH00685; Sep. 19, 1985, PH02501; Nov. 15, 1985, PH03423

Int. Cl.[4] B60R *25/08*

U.S. Cl. 70—203 **9 Claims**



1. A vehicle anti-theft device positionable between operating pedals of the vehicle and the floor of the vehicle to prevent operation of the pedals, comprising:

first and second parallel supports extending upwardly from the floor and having angled base portions for resting on the floor;

a transverse bar secured to and extending perpendicular to said support means adjacent an upper end thereof, said transverse bar having a first end extending substantially perpendicular thereto with a first opening therein and a second opening in said transverse bar spaced from said first end;

a locking bar having a first portion parallel to said transverse bar, a spigot secured to one end of said first parallel portion for insertion into said first opening in said transverse bar, and an aperture in said locking bar which aligns with said second opening in said transverse bar through which a locking device may be inserted to prevent withdrawal of the spigot from the first opening,

said locking bar and said transverse bar defining an enclosed space when secured to one another by the locking device whereby upon placing said transverse bar beneath a support arm of one of said operating pedals and placing said locking bar above the support arm with said spigot inserted axially into said first opening the support arm will be exposed within the enclosed spaced to prevent the pedal from being depressed.

4,700,556

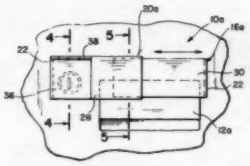
PROTECTIVE VISOR FOR DOOR HANDLES

Darrel E. Wade, Sr., P.O. Box 3266, Parkerburg, W. Va. 26101, and George Spector, 233 Broadway RM 3615, New York, N.Y. 10007

Filed Mar. 14, 1986, Ser. No. 839,630

Int. Cl.[4] E05B *17/18*

U.S. Cl. 70—455 **2 Claims**



1. A protective visor for an automobile door handle in an outer door panel, said visor comprising:

(a) a hood member adapted to house said door handle; and

(b) means for securing said hood member to said outer door panel over said door handle so that said hood member will act to shed rain, hail snow and consequently protect said door handle from all inclement weather and still allow access to operate said door handle, wherein said hood member includes a body element and a pair of side walls formed integrally therewith, said side walls are formed in the nature of a right angle triangle with one leg and top edge of said body element having adhesive securing bear against the adjacent face of said outer door panel and said body element downwardly inclined, wherein said body element of said hood member is adjustably extendable and adapted to house various sizes of said door handle, wherein said adjustably extendable body element includes two plates, said first plate having upper and lower edges turned to produce tracks so that said second plate can slide within said track, wherein said adjustably extendable element further includes a flap hinged thereon and adapted to extend to a position overlying a keylock whereby the flap can be pivoted away from said extendable element to provide access to said keylock.

4,700,557

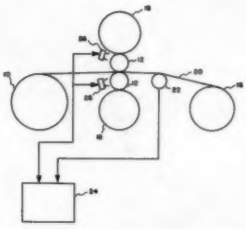
SYSTEM AND PROCESS FOR CONTROLLING THE SHAPE OF A STRIP OF METAL

Dirk De Mol, San Jose, Calif., and Graham Shaw, Carrigaline, Ireland, assignors to Measurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 671,270, Nov. 14, 1984, abandoned. This application Nov. 19, 1986, Ser. No. 931,900

Int. Cl.[4] B21B *37/00, 27/10*

U.S. Cl. 72—12 **7 Claims**



1. A process for controlling the shape of a metal strip being rolled between two rolls, the process comprising:

(a) measuring the shape of the strip;

(b) spraying cooling fluid on at least one of the rolls in a plurality of zones;

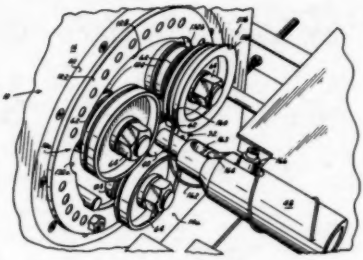
(c) controlling the spraying of cooling fluid based on the measured shape in order to control the shape of the metal strip, wherein the cooling fluid is sprayed in cycles of predetermined time, with each cycle being initiated a predetermined time after the initiation of the immediately preceding cycle.

4,700,558

WIRE COILING METHOD AND DEVICE

Henry G. Mohr, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Apr. 11, 1986, Ser. No. 850,846
Int. Cl.[4] B21F *3/04*
U.S. Cl. 72—145 **18 Claims**



1. Apparatus for coiling wire comprising:

an idler roller having a tapered, forward surface;

a plurality of pinch wheels spaced about the periphery of said idler roller;

guide means for guiding wire between said pinch wheels and said idler roller;

means for longitudinally twisting the wire guided between said pinch wheels and said idler roller to form twisted wire;

said pinch wheels positively clamping said twisted wire against said idler roller, said pinch wheels being rotatable relative to said idler roller for drivingly advancing said twisted wire along said idler roller, at least one of said pinch wheels bending said twisted wire against said tapered surface of said idler roller to form coils.

4,700,559

APPARATUS FOR REPAIRING DEFORMED, YIELDABLE STRUCTURES

Byron A. Larson, 116 LaCrosse Ave., S. San Francisco, Calif. 94080, and John J. Molteni, 540 Keelson Cir., Redwood City, Calif. 94065

Division of Ser. No. 778,802, Sep. 23, 1985, Pat. No. 4,643,015.
This application Oct. 1, 1986, Ser. No. 914,186
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—461 **1 Claim**

1. A device for use in apparatus for repairing a deformed, yieldable structure, said device comprising:

(a) a planar base;

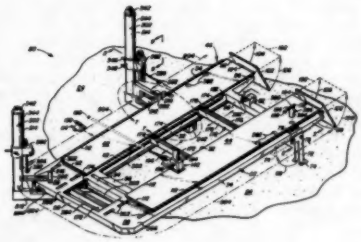
(b) a blade mounting fixture with a planar bottom supported by said base, said blade mounting fixture being formed with a blade aperture;

(c) a holding blade disposed in said blade aperture;

(d) means adjustably movable within said blade mounting fixture for locking said holding blade within said blade mounting fixture;

(e) anchoring fixture with a planar bottom extending from said blade mounting fixture and disposed on said base adjacent said blade mounting fixture;

(f) anchoring means attached to said anchoring fixture for holding said base at a predetermined location; and



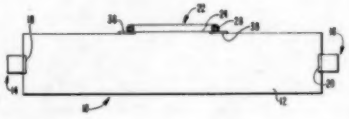
(g) attachment means on said anchoring fixture for applying a pulling force thereto.

4,700,560

CALIBRATION CELL FOR CALIBRATION OF GASEOUS OR NON-GASEOUS FLUID CONSTITUENT SENSORS

Jack L. Hoffa, Brea, and Maurice N. Karkar, Costa Mesa, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 736,767, May 22, 1985, Pat. No. 4,635,467.
This application Aug. 8, 1986, Ser. No. 894,847
Int. Cl.[4] G01C *25/00*
U.S. Cl. 73—1 G **15 Claims**



1. A reference liquid-containing calibration cell for the calibration of a sensor for measuring a gaseous or non-gaseous constituent parameter of a fluid, comprising a chamber containing a reference liquid, wherein said chamber is sealed to prevent loss of said reference liquid, and wherein said chamber includes:

(a) window means for placing the sensor in communication with a reference constituent present in said reference liquid;

(b) means for inleting gas into the chamber, the gas-inleting means including a first semi-permeable membrane permeable to a gaseous fluid constituent but impermeable to said reference liquid and non-gaseous reference constituents present in the reference liquid; and

(c) means for venting gas from the chamber.

4,700,561

APPARATUS FOR MEASURING ENTRAINED GAS-PHASE CONTENT IN A LIQUID

Dougherty, Steven J., 18310 17th St., E., Sumner, Wash. 98390

Filed Feb. 24, 1986, Ser. No. 832,365
Int. Cl.[4] G01N *7/00*
U.S. Cl. 73—19 **8 Claims**

1. Apparatus for determination of an entrained gas-phase component in a liquid sample which comprises:

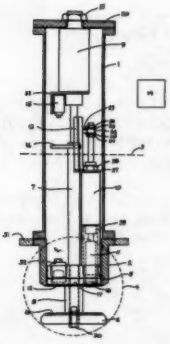
a cylinder having a sample receiving end;

a first piston rod axially located within the cylinder, said first piston rod having mounted thereon a spaced apart first piston and sealing plate, the spacing of said first piston and sealing plate being less than the length of the cylinder, said first piston having a sample contacting face and an opposite face and being sized to fit snugly within the cylinder to

provide a liquid seal, the sealing plate being of greater diameter than the cylinder;

a first actuating means coupled to said first piston rod to translate said first piston within the cylinder and move the sealing plate into and out of sealing relationship with the sample receiving end of the cylinder, so that when in sample receiving position the sample contacting face of said first piston is positioned flush with the sample receiving end of the cylinder and in sample testing position the sealing plate is tightly engaged against the sample receiving end;

a second actuating means mounted on said opposite face of said first piston and moveable therewith, the second actuating means having a second piston rod passing through said first piston in a liquid sealed relationship so as to be translatable toward or away from the sealing plate;



a pressure transducer means mounted to indicate pressure within a volume between said first piston and said sealing plate; and

a transducer responsive to the linear position of said second rod on said second actuating means,

whereby the sample receiving end of the cylinder may be located in a liquid to be sampled with said first piston and sealing plate being in sample receiving position, a sample drawn into the cylinder by retracting said first piston so that a sample is retained in the cylinder between the sealing plate and sample contacting face of said first piston, the second piston rod of the second actuating means then being actuated into the contained sample so that any entrained gas is compressed, the volume of the entrained gas being determined by noting the change in pressure and change in sample volume as indicated by the change in linear position of said second actuating means piston rod.

4,700,562

METHOD FOR DETERMINING EFFECTIVENESS OF CATALYTIC DEWAXING REACTOR

Lawrence J. Altman, Cherry Hill, and James B. Milliken, Paulsboro, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 8, 1986, Ser. No. 816,939
Int. Cl.[4] G01N *33/28*
U.S. Cl. 73—64 **1 Claim**

1. A method for determining the presence of waxy impurities in a catalytically dewaxed hydrocarbon oil comprising:

(a) determining the pour point temperature of a first sample of said hydrocarbon oil using a first method;

(b) determining the pour point temperature of a second sample of said hydrocarbon oil using a second method which would yield approximately the same pour point as that of the first method;

(c) comparing the pour point temperature determined by said first method with the pour point temperature determined by said second method; and

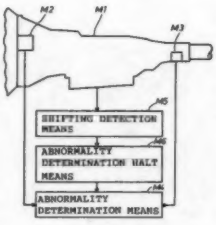
(d) determining the presence of said waxy impurities by the difference in value obtained in step (c).

4,700,563

ABNORMALITY DETERMINATION SYSTEM FOR REVOLUTION SPEED SENSOR

Yasunari Iwata, and Hirokazu Usui, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 26, 1986, Ser. No. 878,663
Claims priority, application Japan, Jun. 28, 1985, 60-143563
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—118.1 **7 Claims**



1. An abnormality determination system for revolution speed sensors comprising:

a first speed sensor for detecting a revolution speed of one shaft of an automatic transmission and for outputting a first speed signal corresponding to the speed;

a second speed sensor for detecting a revolution speed of another shaft of said automatic transmission and for outputting a second speed signal corresponding to the speed;

abnormality determination means for determining if either of said speed sensors is abnormal by comparing the first speed signal from said first speed sensor with the second speed signal from said second speed sensor, and for outputting an abnormality determination signal if it is determined that one of said speed sensors is abnormal;

shifting detection means for detecting that said automatic transmission is shifting and for outputting a shifting indication signal which denotes that a shift of the automatic transmission is being executed; and

abnormality determination halt means for halting the abnormality determination executed by said abnormality determination means when the shifting indication signal is received.

4,700,564

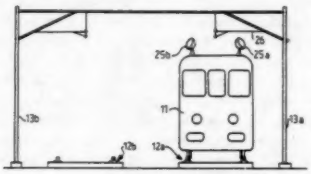
DEVICE FOR AUTOMATICALLY IDENTIFYING CATENARY POSTS OF A RAILWAY TRACK TO LOCATE FAULTS DETECTED ON THE RAILWAY TRACK

Bernard Prasil, Paris, and Jean-Pierre Turbe, Nanteuil-les-Meaux, both of France, assignors to Societe Nationale des Chemins de Fer Francais and Matix-Industries, both of Paris, France

PCT No. PCT/FR85/00326, § 371 Date Jul. 9, 1986, § 102(e) Date Jul. 9, 1986, PCT Pub. No. WO86/03170, PCT Pub. Date Jun. 5, 1986
PCT Filed Nov. 20, 1985, Ser. No. 890,182
Claims priority, application France, Nov. 23, 1984, 84 17870
Int. Cl.[4] G01B *5/28*
U.S. Cl. 73—146 **8 Claims**

1. Process for monitoring the condition of railroad tracks, of the type which consists of moving monitoring equipment on a railroad car (**11**) moving on said tracks (**12***a*) and recording (**21**) the signals emitted by said monitoring equipment (**14–17**)

gradually as said car moves forward, characterized in that it consists of pointing a radar (25*a*) on board said car towards characteristic structures (13) located along said tracks, record-



ing (21) the corresponding echo signals simultaneously with said signals, to contribute to the subsequent identification of defects detected on said railroad tracks.

4,700,565

DEVICE FOR ARTIFICIALLY PRODUCING AIR FLOW

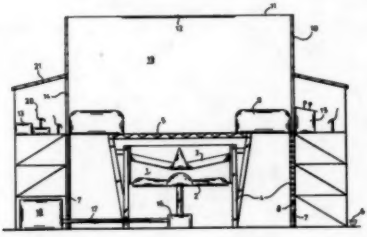
Dieter Albuschkat, Gutersloh, Fed. Rep. of Germany, assignor to Rodenhurst Limited, Douglas, Isle of Man

Filed Aug. 16, 1985, Ser. No. 766,877

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1985, 8424283

Int. Cl.[4] **G01M** *9/00*

U.S. Cl. 73—147 **17 Claims**



1. A device for artificially producing air flow for causing the flotation of persons in the airstream so produced, said device comprising a supporting skeleton adapted to be dismantled and transported and designed for setup on a planar base, a unit arranged in a wind duct for accelerating air together with an associated flow straightener, a horizontally stretched net arranged above said flow straightener, a sound-deadening wall covering said supporting skeleton and extending from said planar base up to the level of said horizontally stretched net, and a sound insulating layer covering the entire surface of said device.

4,700,566

DEVICE FOR DIVIDING VECTOR FORCES INTO THEIR COMPONENTS

Hans W. Häfner, Aichach, Fed. Rep. of Germany, assignor to Pfister GmbH, Augsburg, Fed. Rep. of Germany

Filed Jul. 22, 1986, Ser. No. 888,178

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528727

Int. Cl.[4] **G01L** *5/16;* **G01M** *9/00*

U.S. Cl. 73—147 **14 Claims**

11. A 7-components wind tunnel force measuring apparatus for determining force components exerted on an object to be tested comprising:

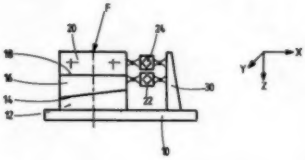
a plurality of devices for dividing vector forces into coordinate components, the devices corresponding in number supporting points of the object to be tested and arranged there at, each device comprising:

a base;

a main body mounted on the base and having a flat upper surface inclined to the horizontal;

a wedge having a bottom surface inclined to the horizontal engaging essentially frictionfree the upper surface of the main body, and a flat horizontal upper surface;

at least one first force measuring element acting in a direc-



tion of the wedge action and being provided in a fixed relationship to the main body;

an upper element having a flat bottom side bearing essentially frictionfree in horizontal directions on the horizontal upper surface of the wedge and receiving a vector force to be measured; and

at least one second force measuring element each acting in the at least on the X- and Y-directions, limiting any movement of the upper element and being arranged in fixed relationship to the main body.

4,700,567

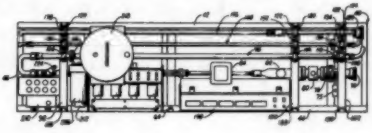
RHEOLOGY TEST SYSTEM

Emory L. Frey; David W. Looper, and Eugene J. Daunis, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 21, 1985, Ser. No. 801,121

Int. Cl.[4] **E21B** *21/06;* **G01N** *11/04*

U.S. Cl. 73—151 **17 Claims**



9. A laminar flow rheology apparatus, comprising:

a base; and

a helical pipe assembly mounted on said base, said assembly including a plurality of lower pipe sections and a plurality of upper pipe sections and a plurality of connecting pipe sections disposed so that each connecting pipe section connects a respective one of said lower pipe sections with a respective one of said upper pipe sections.

4,700,568

PULSE ACCUMULATOR NETWORK ADAPTED FOR USE IN A FLOW MONITORING SYSTEM

William M. Sleffel, Edmond, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 11, 1986, Ser. No. 838,591

Int. Cl.[4] **G01F** *1/00*

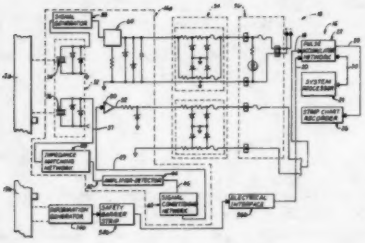
U.S. Cl. 73—195 **19 Claims**

1. A flow monitoring system for monitoring fluid flow passing through a plurality of monitored flowlines comprising:

a plurality of information generators, each information generator being operatively connected to one of the monitored flowlines and each information generator detecting

the fluid flow passing through the monitored flowline connected thereto and each information generator outputting flow signals in a digital format in a pulse train indicative of the velocity of the fluid passing through the monitored flowline connected thereto;

a pulse accumulator network receiving the flow signals outputted by each of the information generators and accumulating the pulses in each of the received flow signals, each of the accumulated count of pulses being an accumulated flow signal; and



a system processor connected to the pulse accumulator network, the system processor outputting polling signals for polling the pulse accumulator network, the pulse accumulator network receiving the polling signals and the pulse accumulator network outputting each accumulated flow signal in response to receiving the polling signals, each accumulated flow signal being indicative of the velocity of the fluid flowing through one of the monitored flowlines.

4,700,569

METHOD AND ARRANGEMENT FOR SIGNAL TRANSMISSION IN ULTRASONIC ECHO SOUNDING SYSTEMS

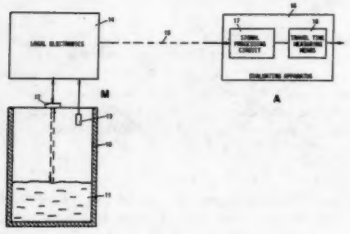
Bernhard Michalski, Schopfheim; Jürgen Lau, Weil am Rhein, and Wolfram Berger, Steinen, all of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,906

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339968; Oct. 17, 1984, 3438045

Int. Cl.[4] G01F *23/28*

U.S. Cl. 73—290 V **24 Claims**



1. A method of signal transmission between an ultrasonic echo sounding apparatus disposed at a measuring location and an evaluation station remote from the measuring location, ultrasonic transmission pulses being transmitted at the measuring location in successive transmission periods and the ultrasonic echo pulses received after reflection at a target being converted to electrical reception signals, comprising the steps of generating, at the measuring location, from said electrical reception signals electrical envelope signals which represent the envelope curves of the echo pulses and transmitting said envelope signals via a connecting line to the evaluation station in a first station section of each transmission period, the duration of said first section being at least equal to the maximum travel time of the ultrasonic transmission and echo pulses, said envelope signals being evaluated at the evaluation station for determining the target distance from the travel time of the ultrasonic pulses, generating at the measuring location at least one low-frequency electrical signal which is characteristic of a propagation medium parameter necessary for the evaluation of the envelope signals and transmitting said low-frequency electrical signal via the same connecting line to the evaluation station in a second section of the transmission period, and transmitting in the second section of the transmission period at least one control signal via the same connecting line from the evaluation station to the measuring location, which said control signal is distinguishable from the low-frequency electrical signal transmitted in the same second section of the transmission period via the same connecting line.

4,700,570

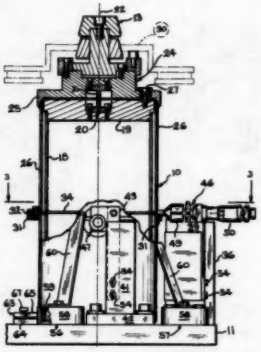
HARD STATIC BALANCING MACHINE

Gordon E. Hines, Ann Arbor, Mich., assignor to Hines Industries, Inc., Ann Arbor, Mich.

Filed Mar. 14, 1986, Ser. No. 839,886

Int. Cl.[4] G01M *1/02*

U.S. Cl. 73—483 **8 Claims**



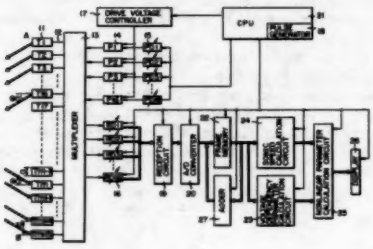
1. A hard static balancing machine comprising, in combination,

a stationary support member having an upper end and a lower end, said stationary support member defining a vertical axis, a pivot pin member mounted on such vertical axis adjacent said upper end of said stationary support member, a workpiece support assembly mounted on said pivot pin member, a transmitting member depending from said workpiece support assembly adjacent said stationary support member, at least two force rods attached to said depending transmitting member and extending outwardly from said stationary support member, said force rods extending completely through said depending transmitting member and said stationary support member, a strain gauge load cell assembly attached to each of said force rods for measuring workpiece displacement and for applying a restoring force to each of said force rods.

4,700,571
ULTRASONIC IMAGING APPARATUS

Kiyoshi Okazaki, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 18, 1986, Ser. No. 875,687
Claims priority, application Japan, Jun. 19, 1985, 60-133421
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—597 **9 Claims**



1. An ultrasonic imaging apparatus for measuring the sound velocity of an ultrasonic wave propogating through a tissue of an object to be investigated, said apparatus comprising:

an ultrasonic transducer means for transmitting ultransonic waves to the object to be investigated, said transducer means including a plurality of ultrasonic elements arranged in a row;

means for driving a first transducer group of said ultransonic transducer means to emit an ultrasonic transmission beam to a plurality of discrete areas of the object, said first transducer group including a predetermined number of transducer elements of said ultransonic transducer means;

means, including a plurality of second transducer groups corresponding to said plurality of areas of the object, said seoond transducer groups being spaced apart from said first transducer group and each of said second transducer groups having a predetermined number of transducer elements, for receiving a plurality of echo beams from said areas of the object, said echo beams propagating in a direction crossing the direction of said transmission beams, said second transducer groups being equal in number to the number of said plurality of areas of the object;

means for measuring the time from emission of said transmission beams from said transducer group to reception of the corresponding echo beams at one of said second transducer groups for each of said received echo beams;

means for determining the sound velocity for each received echo beam propogating through the areas of said object to obtain a plurality of sound velocities; and

means for displaying the sound velocities from said determining means.

4,700,572
AUTOMATIC ULTRASONIC FLAW DETECTING SYSTEM

Takashi Senba, and Satoru Tachikawa, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1986, Ser. No. 842,458
Claims priority, application Japan, Apr. 3, 1985, 60-70311; Apr. 3, 1985, 60-49421[U]
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—622 **3 Claims**

1. An automatic ultrasonic flaw detecting system adapted to search flaws on steel pipes being continuously transferred and provide markings at the positions of flaws on said steel pipes, comprising:

(a) a probe adapted to search flaws on a steel pipe;

(b) a means for holding said probe;

(c) a flaw pulse generation circuit adapted to generate flaw pulse signals in response to the flaw signals from said probe;

(d) a travel measurement pulse generator adapted to generate measurement pulse signals by measuring the distance which said steel pipes have travelled;

(e) a pipe end sensor adapted to detect the end of said steel pipe and generate pipe end detection signals;

(f) a flaw tracking control means adapted to track the flaws in response to said flaw pulse signals, said measurement pulse signals and said pipe end detection signals and generate marking control signals; and

(g) a means adapted to provide a marking at the position of flaws detected on said steel pipe in response to said marking control signals;

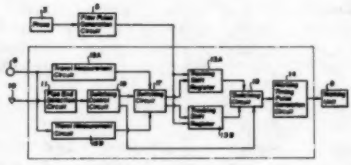
said flaw tracking control means further comprising:

(a) a first travel measurement circuit adapted to count said measurement pulse signals and generate normal distance pulse signals;

(b) a second travel measurement circuit adapted to count said measurement pulse signals and generate compensating distance pulse signals;

(c) a pipe end detection circuit adapted to generate pipe end pulse signals in response to said pipe end detection signals;

(d) a switching control circuit adapted to generate switching control signals in response to said pipe end pulse signals;



(e) a first tracking shift register adapted to delay said flaw pulse signals by a predetermined time in response to said normal distance pulse signals, said compensating distance pulse signals and said flaw pulse signals in order to adjust the timing of marking relative to the position of flaws on the steel pipe being currently inspected;

(f) a second tracking shift register adapted to delay said flaw pulse signals by said predetermined time in response to said normal distance pulse signals, said compensating distance pulse signals and said flaw pulse signals in order to adjust the timing of marking relative to the position of flaws on the next steel pipe following the steel pipe currently being examined;

(g) a first switching circuit adapted to select either said normal distance pulse signals or said compensating distance signals in response to said switching control signals;

(h) a second switching circuit adapted to select either of the output signals of said first or second tracking shift register in response to said switching control signals; and

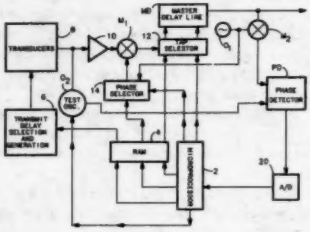
(i) a circuit adapted to generate the marking timing pulse signals in response to the output signals of said first or second tracking shift register so as to control said marking means based on the selection executed by said second switching circuit.

4,700,573

METHOD TO IMPROVE ACCURACY IN DELAY LINES

Bernard J. Savord, Ithaca, N.Y., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 7, 1986, Ser. No. 837,486
Int. Cl.[4] G01N *29/00*; G01L *25/00*
U.S. Cl. 73—625 3 Claims



1. An ultrasonic system comprising

an array of transducer elements,

means coupled to said transducer elements for causing them to periodically transmit bursts of ultrasonic carrier pressure waves in respectively different directions,

phase shifters having inputs and outputs, said inputs being respectfully coupled to said transducer elements,

a master delay line having a plurality of input taps and an output,

tap selection means for respectively connecting the outputs of said phase shifters to selected taps on said master delay line, the delay between at least some of said taps and the output of said delay line having errors so as to be different from desired values,

a memory in which an indication of the error in delay for each tap is stored, and

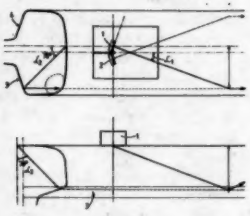
means for adjusting the phase provided by each of said phase shifters as required for range focussing in such manner as to compensate for the error in delay of the tap that is stored in said memory.

4,700,574

ULTRASONIC DETECTION METHOD OF THE INTERNAL DEFECTS OF A RAILROAD TRACK RAIL LOCATED IN THE SIDES OF THE HEAD OF SAID RAIL AND DEVICE TO CARRY IT OUT

Jean-Pierre Turbe, Nanteuil les Meaux, France, assignor to Matix Industries, Paris, France

Filed May 15, 1986, Ser. No. 863,683
Claims priority, application Switzerland, May 15, 1985, 02087/85
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—636 4 Claims



1. A method for ultrasonic detection of displaced oval flaws in a rail head having a median plane of symmetry, comprising the steps of:

displacing a support in sliding contact with a rail head along said median plane at a constant rate of speed, said support comprising a pair of ultrasonic emitter-receivers symmetrically disposed on opposite sides of said median plane such that each said emitter-receiver is adapted to emit across said median plane an ultrasonic beam of constant orientation having a vertical projection forming an angle of 60°–80° on said median plane and a horizontal projection forming an angle of 10°–25° relative to said median plane;

alternately emitting ultrasonic beams from each of said pair of ultrasonic emitter-receivers;

receiving an echo of a said emitted ultrasonic beam reflected by a displaced oval flaw in said rail head; and

determining on which side of said median plane said displaced oval flaw is located, based on a time difference between the corresponding said alternate emission and its reception by one of said pair of emitter-receivers.

4,700,575

ULTRASONIC TRANSDUCER WITH SHAPED BEAM INTENSITY PROFILE

Glenn A. Geithman, and Dennis H. Gilbert, both of Renton, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 31, 1985, Ser. No. 815,162
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—642 17 Claims

1. Ultrasonic testing apparatus for detecting defects in a workpiece, said apparatus comprising:

a supply of liquid coupling medium;

an ultrasonic sending assembly connected to said supply, said ultrasonic sending assembly being spaced away from said workpiece and including nozzle means for producing an elongated stream of liquid coupling medium directed against the workpiece for coupling ultrasonic energy into said workpiece;

said ultrasonic sending assembly including means for generating an ultrasonic signal having a first surface, and a layer of attenuation material formed on said first surface for coupling said ultrasonic signal into said stream, said material attenuating said ultrasonic signal at the periphery of said first surface by an amount greater than the attenuation at the center of said first surface, whereby an apodized beam of ultrasonic energy is coupled to said stream;

means for receiving ultrasonic said ultrasonic signal; and

means for analyzing said received signal to detect defects in said workpiece.

16. An ultrasonic transducer for transmitting an ultrasonic signal into an adjacent medium, comprising:

a housing;

means mounted within said housing for generating an ultrasonic signal, said means having a first surface; and

a layer of attenuation material formed on said first surface, said layer having an acoustic impedance which is equal to the geometric means of the acoustic impedances of said generating means and said adjacent medium.

4,700,576

PROCESS AND DEVICE FOR EXECUTING THE SCREWING OF A THREADED JOINT FOR TUBES, EQUIPPED WITH A STOP

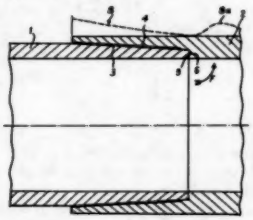
Didier Grare, and Hervé Salkin, both of Aulnoye-Aymeries, France, assignors to Vallourec, Paris, France

Filed Oct. 8, 1985, Ser. No. 785,397

Claims priority, application France, Oct. 8, 1984, 84 15403

Int. Cl.[4] G01L *5/24*

U.S. Cl. 73—761 **6 Claims**



1. Process of executing the screwing of a threaded joint for steel tubes, designed especially for the petroleum industry, of the type having a male element (1) with external threads (3) and a female element (2) with internal threads (4), as well as at least one pair of screwing limit stops (5,6) on the male element (1) and female element (2) respectively, characterized by the fact that before proceeding with the screwing down of the joint, a strain gauge (12) is applied to the external surface of the female element (2) at a certain distance (D) from the plane (9) of the screwing limit stop (6) and on the side of said plane which is opposite that of the threads (3,4), which allows the instantaneous measurement of longitudinal deformations of the external surface along a line of the female element (2) and that the screwing down of the joint is carried out until the indication provided by the strain gauge (12) corresponds to an extension of a predetermined value of the surface of the female element (2).

4,700,577

QUALITY CONTROL FOR SUCKER RODS

Harley A. Tripp, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 619,508, Jun. 11, 1984, abandoned. This application Oct. 9, 1986, Ser. No. 917,282

Int. Cl.[4] G01N *3/08*; G01H *1/00*

U.S. Cl. 73—801 **3 Claims**

1. A method for testing the overall quality of a fiberglass sucker rod having a known ultimate strength, comprising:

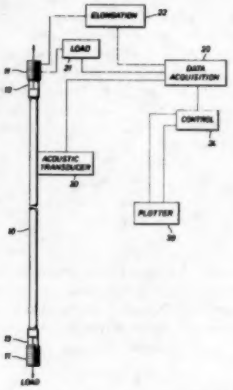
applying tension loads that are less than said known ultimate strength to the end fittings of such a rod,

measuring the applied loads and elongation for such a rod,

measuring the acoustic emissions from such a rod during said applying of said tension loads,

determining from said measured loads and elongation the modulus of elasticity for at least two different load ranges, and

determining from the difference between said moduli of elasticity whether said end fittings of such a rod are acceptably attached and from said measured acoustic emissions whether the material of such a rod is acceptable.



4,700,578

APPARATUS FOR MEASURING A BULK STREAM

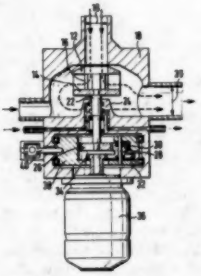
Hans-Georg Fassbinder, Sulzbach-Rosenberg, Fed. Rep. of Germany, assignor to Klockner CRA Technologie GmbH, Fed. Rep. of Germany

Filed Mar. 5, 1986, Ser. No. 836,391

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507993

Int. Cl.[4] G01F *1/82*

U.S. Cl. 73—861.37 **8 Claims**



1. An apparatus for measuring a bulk stream comprising:

a rotating element borne by a first shaft,

means for axially introducing said bulk stream to said element, said element being driven at a constant speed and radially deflecting the bulk stream acting axially upon said rotating element, thereby impressing on it a tangential velocity component, the torque dependent on the bulk stream being measured at the first shaft;

a two-step spur gear disposed in a pivot mounted carrier element (38) and having four spur wheels;

the first spur wheel is disposed on the first shaft and meshes with the second spur wheel disposed on an intermediate shaft;

the third spur wheel is also disposed on the intermediate

shaft and meshes with the fourth spur wheel, said fourth spur wheel is disposed on a driving shaft,;

the intermediate shaft is movably mounted in the carrier element, the direction of movement of said intermediate shaft corresponding to the direction of the reaction force acting on the intermediate shaft; and

said carrier element is fixed in its position by a force measuring means, and in that the idling friction torque RM_A of the first shaft and the idling friction torque RM_Z of the intermediate shaft satisfy, with their absolute values and the predetermined condition R_3 is greater than R_2, the following condition:

$$\frac{R_3 - R_2}{R_1} = \frac{RM_Z}{RM_A}$$

wherein

R_1 = geometrical radius of the first spur wheel,

R_2 = geometrical radius of the second spur wheel,

R_3 = geometrical radius of the third spur wheel,

R_4 = geometrical radius of the fourth spurh wheel.

4,700,579

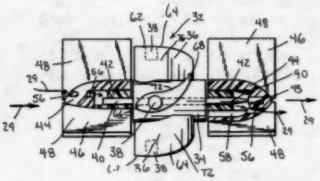
DIGITAL FLOW METER FOR DISPENSING FLUIDS

Robert E. Hall, Wichita, Kans., assignor to Great Plains Industries, Inc., KS

Continuation-in-part of Ser. No. 553,793, Nov. 21, 1983. This application Feb. 5, 1986, Ser. No. 826,297

Int. Cl.[4] G01F *1/115*

U.S. Cl. 73—861.78 **1 Claim**



1. A flow meter for mounting in a fluid delivery line for dispensing fluids, the flow meter comprising;

a meter housing having a display cavity disposed in the top thereof and a fluid opening therethrough, the opposite ends of the housing adjacent the fluid opening threaded for coupling to the delivery line;

a turbine having a turbine rotor with a turbine shaft extending outwardly from the opposite ends of the turbine rotor, the turbine further having a plurality of turbine blades extending outwardly from the sides of the turbine rotor, each blade turbine having a ferrous slug embedded in an enlarged flattened area in the end thereof, the flattened area adjacent a rounded leading edge with the turbine blade tapered from front to rear into a feathered trailing edge, each turbine blade having a top concave surface along its length for receiving the force of the fluid there against and driving the turbine and a bottom convex surface along the its length, the turbine blades when viewed end to end having a hydrofoil type design;

a pair of shaft supports, each of the shaft supports including a support base with a plurality of support arms extending outwardly therefrom, the ends of the support arms attached to the sides of the fluid opening, the support base having fluid ports therein and communicating with enlarged fluid cavities disposed so that fluid is washed around and beside the end of the shaft, the end of at least one of the turbine shafts engaging a thrust bearing mounted in the support base;

a pickup coil with magnet mounted in the display cavity of the housing, the magnet disposed adjacent the outer periphery of the fluid opening for sensing magnetic pulses as the turbine blades with the ferrous slugs are rotated therepast; and

electric counter means for converting the magnetic pulses to a readable count, and for displaying the readable count on a digital counter mounted in the top of the display cavity of the housing.

4,700,580

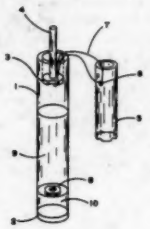
AVIATION FUEL TESTER

Paul N. Kamin, Town St., W Cornwall, Conn. 06796

Filed Feb. 24, 1986, Ser. No. 831,871

Int. Cl.[4] G01N *1/10*

U.S. Cl. 73—864.51 **4 Claims**



1. An aviation fuel tester comprising:

a hand-held container for receiving a sample of fuel from an airplane fuel tank, said container possessing an attached prong made of soft steel metal, and also possessing a removable attachment with a plurality of diametrically opposed indentations, said container and attachment being made of extruded clear acrylic plastic and thus transparent to allow visualization of the aviation fuel received therein, said tester possessing a string means made of a length of 10 lb. test fish line tied to form a loop tying the said removable attachment to the said container, said container being tubular and closed at one end, the other end of said container possessing a disk coaxially mounted inside the container in a recessed position, said disk possessing drain vents, thereby allowing communication of received aviation fuel between the open end of said container and the container interior, said disk forming a base containing a well into which the said prong is securely and permanently attached in a coaxial orientation, said disk also simultaneously preventing exit from the container of a float container therein, said float being made of polyethylene of density 0.94–0.96 g/cc so as to sit at a gasoline-water interface.

4,700,581

SINGLE BALL TRACTION DRIVE ASSEMBLY

Edward C. Tibbals, Jr., High Point, N.C., assignor to William R. Loeffler, Englewood, Colo.

Continuation of Ser. No. 346,289, Feb. 5, 1982, abandoned. This application Nov. 18, 1985, Ser. No. 799,547

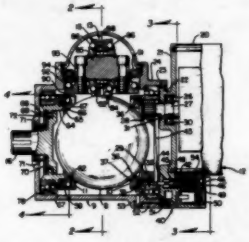
Int. Cl.[4] F16H *15/26*

U.S. Cl. 74—198 **7 Claims**

1. In a variable drive transmission wherein a pair of independently rotatable input and output members are disposed in spaced facing relation to one another and a speed control mechanism therebetween to regulate the speed ratio between input and output members, said speed control mechanism comprising:

a single variable transmission element of generally spherical shape positioned between said input and output members, said transmission element being rotatable about a variable axis of rotation to impart the torque of said input member

to said output member at a variable speed ratio, said input and output members being in the form of generally ring-like members having generally concave surfaces engageable with said transmission element on opposite sides of said transmission element, said output member having a bearing assembly provided with circumferentially spaced, rollable bearing elements between a pair of opposed races, one of said races defining one of said generally ring-like members including said concave surface and being journaled by said bearing elements with respect to the other of said races, internal confronting surfaces of said races having ramp members extending in a circumferential direction and angled inwardly toward said transmission element to cause the inward movement of said bearing elements along said ramp members whereby in response to increases in torque said bearing assembly means is operative to urge said one race against said transmission element and increase the pressure between said transmission element and said input and output members; and



rotatable control roller means establishing surface engagement with said transmission element symmetrically about an imaginary radial line through the center of said transmission element which radial line bisects the angle formed between imaginary radial line extending from the center of said transmission element the points of engagement of said input and output members, said rotatable control roller means including means mounting said control roller means under predetermined compression to exert force against said transmission element in a direction causing said transmission element to bear against a limited surface portion of each of said input and output members, said rotatable control roller means being pivotal about said first imaginary radial line passing therethrough so as to establish an angle of surface engagement with said transmission element to vary the axis of rotation of said transmission element and thereby to vary the speed ratio of said input member to said output member through said transmission element.

4,700,582

ANTI-BACKLASH GEAR MECHANISM

Ramon L. Bessette, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 31, 1985, Ser. No. 740,103

Int. Cl.[4] F16H *55/18*

U.S. Cl. 74—409 **12 Claims**

7. A device for suppressing backlash noise in a manual change-speed transmission comprising:

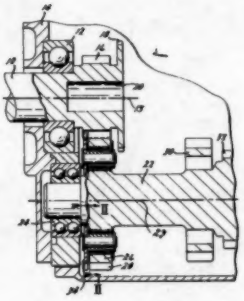
an input shaft rotatably mounted about an axis and adapted to be clutched to an engine, including an input pinion wheel fixed to the input shaft;

a countershaft rotatably mounted about a first axis parallel to the axis of the input shaft, including a gear wheel having a hole spaced radially from the first axis and teeth meshing with the teeth of the pinion wheel;

a load plate mounted for rotation coaxially with the countershaft having teeth adapted to mesh with the teeth of the pinion wheel, and a hole whose center is spaced radially from the first axis;

the gear wheel having a hole whose center is spaced radially from the first axis substantially the same radial distance as the center of the hole of the load plate is spaced from the first axis, said gear wheel hole having its center offset angularly from the center of the hole of the load plate when the teeth of the load plate and of the gear wheel are arranged to mesh with the teeth of the input pinion wheel;

a spacer made from readily deformable material located in the hole of the gear wheel, having a first portion extending in a first direction axially beyond the gear wheel and adjacent the load plate whereby said load plate and said



first gear wheel are spaced apart, and a second portion extending in a second direction axially beyond the gear wheel; and

a pin extending through the spacer and the holes of the load plate and the holes of the gear wheel, having a first headed end located adjacent the load plate, and a second headed end adjacent the second portion of the spacer, adapted to angularly align the holes of the load plate and gear wheel, whereby the load plate teeth are resiliently urged due to deformation of the spacer into contact with a first face of the teeth of the input pinion wheel and the gear wheel teeth into contact with a second face of the teeth of the input pinion wheel on the opposite side from the first face.

4,700,583

GEAR MOUNTING

Raymond J. Hicks, Powys, Wales, assignor to Hicks Transmissions Limited, Powys, Wales

Filed May 2, 1983, Ser. No. 490,206

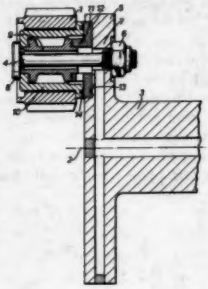
Claims priority, application United Kingdom, May 1, 1982, 8212752

Int. Cl.[4] F16H *57/02*

U.S. Cl. 74—410 **7 Claims**

1. A gear mounting having a carrier, a cantilever spindle extending substantially normal to the carrier and capable of radial excursions from an initial position when under load, the spindle comprising a central flexible tie bolt, a surrounding co-axial symmetrical flexible tubular member under compression by the bolt against the carrier, a bearing sleeve for a gear cantilevered back from the outer end of the spindle remote from the carrier and freely surrounding the tubular compression member, the flexure of the tubular member under a load whose resultant is transverse to it and through its centre being such that it assumes a configuration where the outer end portion is parallel to but offset from the inner end portion, and a bush, rigid in comparison with the bolt and compression member, interposed and positively located between that compression member and the carrier, one outwardly flanged end of the compression member being received in an annular recess in the bush defined by a cylindrical wall and a radial wall, the flange

being formed so that, when the tie bolt is tensioned, urging said flanged end of the compression member against the radial wall,



said end is distorted to take up any radial clearance between itself and the cylindrical wall of the recess.

4,700,584

MANIPULATOR USABLE FOR A GLASS ELECTRODE OR THE LIKE

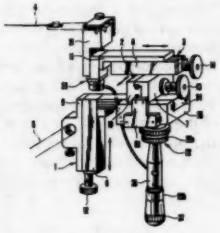
Eiichi Narishige, and Shinji Yoneyama, both of Tokyo, Japan, assignors to Narishige Corporation, Ltd., Tokyo, Japan

Filed Apr. 18, 1986, Ser. No. 853,714

Claims priority, application Japan, Feb. 15, 1986, 61-020547[U]

Int. Cl.[4] G05G *11/00*

U.S. Cl. 74—479 **3 Claims**



1. A manipulator assembly for moving a glass electrode or the like in a lateral, a longitudinal and a heightwise direction, comprising:

means for providing a rough adjustment of the position of the glass electrode in the lateral, longitudinal and heightwise direction;

a first base member which is adjustable in the heightwise direction by said rough adjustment means, said first base member having a small spherical body projectively provided thereon;

means for providing fine adjustment of the position of the glass electrode in the longitudinal and lateral direction; including a large spherical body having a receiving bore defined therein, a sleeve adapted to be operably connected to the glass electrode for housing the large spherical body, a first fine movement slider means for allowing the sleeve to move relative to the first base member in the lateral direction, and operation lever means for rotating the large spherical member relative to the sleeve, the small spherical body being receivable in said receiving bore, whereby movement of the operation lever means causes the glass electrode to finely move in the lateral and longitudinal direction;

a hydraulic cylinder disposed in said operation lever means having a diaphragm therein and operation knob mounted thereon for actuating said diaphragm; and

hyraulic means for providing fine adjustment at the position of the glass electrode in the heightwise direction, said hydraulic means being actuatable by fluid supplied from said hydraulic cylinder, whereby a glass electrode may be positioned by being moved to an approximate desired position by said rough adjustment means, and to a final position by using said fine adjustment means and said hydraulic means.

4,700,585

DRIVE FOR THE COMPOUND STAGE OF A MICROSCOPE OR SIMILAR APPARATUS

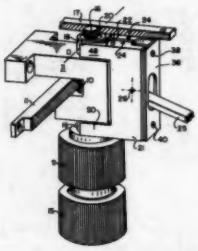
Heinz Märzhäuser, Wetzlar, Fed. Rep. of Germany, assignor to Gebr. Märzhäuser Wetzlar oHG, Wetzlar, Fed. Rep. of Germany

Filed Apr. 1, 1986, Ser. No. 846,820

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1985, 3528615

Int. Cl.[4] G02B *21/26*; G05G *11/00*

U.S. Cl. 74—479 **6 Claims**



1. In a drive system for an x-y stage of a microscope or similar instrument having a first displaceable slide and a second slide displaceable at an angle to said first slide, first stationary slide guide means for said first displaceable slide and a second stationary slide guide means for said second slide comprising:

(a) a rack and pinion connection having first and second pinions and first and second racks arranged respectively between said first slide and said first stationary slide guide means on the one hand and between said first slide and said second slide;

(b) said first pinion having a first actuation knob and a first common solid shaft;

(c) said second pinion having a second actuation knob and a second common hollow shaft coaxial to said first shaft;

(d) a braking jaw for each shaft and movable into an open and into a braking position, which in the open position releases its associated shaft so it may rotate easily and which in its braked position brakes this shaft to render rotation difficult, and comprising one clamping element for each, braking jaw, where said element is movable by an actuation device resting on said first slide into a position closing or opening the braking jaw; and

(e) where the shafts rest in ball bearings to assure easy rotation of the shafts for the open position,

the improvement comprising:

said braking jaws **(18, 19)** comprising closed plastic rings and said clamping elements **(21, 22)** comprising U-shaped components each resting with one of their U-legs against the same side of each of the braking jaws **(18, 19)** at the level of a central axis of said coaxial shafts **(6, 12)**, both clamping elements being pivotable simultaneously by said actuation devices **(25)** about axes parallel to each other and to the central axis of the coaxial shafts **(6, 12)** so that for the braking position they brake the motion of the

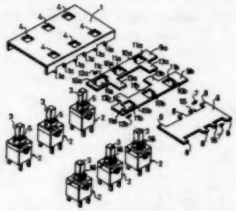
coaxial shafts (6, 12) while deforming the braking jaws (18, 19) and for the open position they release the shafts so they may be easily rotated.

4,700,586

MECHANISM FOR PREVENTING SIMULTANEOUS LOCKING OF MULTI-COLUMN SWITCHES

Teiichi Miura, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Apr. 28, 1986, Ser. No. 856,693
Claims priority, application Japan, Apr. 27, 1985, 60-63677[U]
Int. Cl.[4] G05G 1/02; H01H 9/26
U.S. Cl. 74—483 PB 8 Claims



1. A mechanism for preventing simultaneous actuation of first and second switches in first and second columns, respectively, of a multicolumn switch assembly, the columns being arranged longitudinally and having a plurality of switches in each column, comprising:

each switch having a slide portion which is depressable from a first position to a second position, said slide having on one side thereof a bearing surface;

first and second slidable preventing members arranged longitudinally spaced apart in parallel with each other, each preventing member being disposed with respect to a respective one of said columns of switches and having a plurality of cutout portions each engageable with a bearing surface of a corresponding one of the switches in the respective column when the slide portion is depressed to the second position so as to slide the preventing member by a predetermined distance in one longitudinal direction of the assembly, said first and second preventing members being slidable in opposite longitudinal direction from the other when switches in the respective columns are depressed;

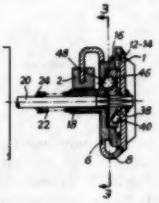
said first and second preventing members having first and second bearing sections, respectively, which extend toward each other so as to be engageable with each other if said first and second preventing members are both moved at the same time in opposite longitudinal directions, said first and second bearing sections being initially spaced apart by a gap smaller than the sum of the predetermined distances the preventing members must move if switches in both columns are simultaneously depressed to the second position, whereby the bearing sections will compete for space in said gap so that only one of the two preventing members can slide the full length of its predetermined distance of longitudinal movement at a time.

4,700,587

DEVICE FOR CONTROLLING THE RELATIVE DISPLACEMENT OF TWO ELEMENTS, IN PARTICULAR FOR A VEHICLE SEAT STRUCTURE

Francois Bianchi, Valentigney; Denis Busa, Audincourt, and Francois Fourrey, Montbeliard, all of France, assignors to Cycles Peugeot, Valentigney, France

Filed Jun. 13, 1986, Ser. No. 876,521
Claims priority, application France, Apr. 1, 1986, 86 04614
Int. Cl.[4] G05G 5/06
U.S. Cl. 74—527 6 Claims



1. A device for controlling the relative displacement of two elements, said device comprising a side wall for connection to one of said two elements, a first toothed ring fixed relative to the side wall, a control rod extending coaxially through the toothed ring, a bar which is for pivotally connecting to the other of said two elements and provided with a rectilinear set of teeth, a rotary gear pinion which is coaxial with and rotatable relative to the control rod and has gear teeth engaged with said set of teeth on the bar, a cup fixed coaxially to the gear pinion and having an end wall, a second toothed ring fixed coaxially relative to the cup, means resiliently biasing the second toothed ring into engagement with the first toothed ring, a driving plate disposed coaxially inside the cup and keyed to rotate with the control rod, means for rotatively supporting the plate axially against the side wall, coupling means coupling the driving plate to the cup for rotation of the cup by the shaft in either direction, the coupling means comprising cooperative abutment means on the plate and the cup and further comprising means for producing a given lost-motion travel of the driving plate relative to the cup before positive drive of the cup by the plate through said cooperative abutment means in the two directions of rotation, bvall means rotatively mounted in one of two members consisting of the driving plate and the end wall and partly projecting from a side of said one member for rolling engagement with the other of said two members so as to maintain teeth of the second toothed ring axially out of engagement with teeth of the first toothed ring, recess means in said other of said two members in a limited part of a circular path of rotation of said ball means relative to said one of said two members upon rotation of the driving plate relative to the end wall for the purpose of causing the ball means to enter the recess means and thereby permit the second toothed ring which is fixed relative to the cup to move into axial engagement with the first toothed ring, said lost-motion travel being sufficient to allow the ball means to move out of the recess means in each direction of rotation of the driving plate before cooperation between said abutment means and a driving of the cap by the driving plate.

4,700,588

PEDAL FOR A BICYCLE

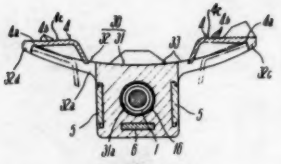
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 554,704, Nov. 23, 1983, abandoned. This application Dec. 20, 1985, Ser. No. 810,903

Claims priority, application Japan, Nov. 29, 1982, 57-180810[U]; Dec. 21, 1982, 57-194328[U]; Sep. 16, 1983, 58-171830

Int. Cl.[4] G05G 1/14

U.S. Cl. 74—594.4 15 Claims



1. A pedal for a bicycle, comprising a pedal shaft and a pedal body made from synthetic resin and supported rotatably on said pedal shaft, said pedal body including a rigid main body having bearings including a foot bearing surface, said pedal body including foot bearing members each having a foot bearing surface, said foot bearing members having elastically displaceable portions, said main body comprising a housing having disposed therein said bearings and having a root and an utmost end, and frame members extending forwardly and rearwardly from said housing at said root and said utmost end, said foot bearing members of said pedal body being disposed in a space between said frame members and cantilevered with at least one of said housing and a said frame member to be elastically displaceably coupled therewith through said elastically displaceable portions, said foot bearing surface at each of said foot bearing members projecting outwardly with respect to said foot bearing surface at said main body and being displaceable downwardly by treading pressure of a cyclist's foot to cause said foot bearing surface of said main body to be in position to bear a pedalling force applied by said cyclist's foot, whereby said foot bearing surfaces at said foot bearing members are elastically displaceable with respect to said main body respectively, said elastically displaceable portions being integral with said main body, said foot bearing members and said frame members being in a non-overlapping relation with each other along apdealling direction of said pedal.

4,700,589

CORONEL RADIANT DRIVE SYSTEMS

Paul K. Coronel, 75-380 Aloha Kona Dr., Kailua-Kona, Hi. 96740

Filed Feb. 14, 1986, Ser. No. 830,505

Int. Cl.[4] F16H 37/06, 1/40

U.S. Cl. 74—705 10 Claims

1. An all gear rotary motion transmission comprising:

(a) an initial crown plate which rotates about a central axis and has a central bore;

(b) at least one unitary coupler, each coupler including:

(i) a satellite pinion with which the initial crown plate is connected in driving relation to produce a first stage rotary multiplication product;

(ii) a beveled pinion transmitting gear; and

(iii) a connecting shaft which at one end is rigidly connected to the satellite pinion and at another end is rigidly connected to the beveled pinion transmitting gear so that the coupler transmits the first stage rotary multiplication product;

(c) two output receiving gears with which all the beveled pinion transmitting gears are connected in driving relation, both output receiving gears rotating about the central axis;

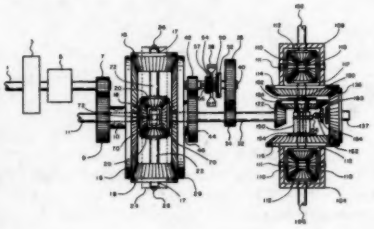
(d) a circular retaining ring including equidistantly spaced bearing supports for the couplers, the satellite pinion of each coupler being rotatably connected to the ring through a bearing support;

(e) a central bearing block to which the beveled pinion transmitting gear of each coupler is rotatably mounted, and to which the two output receiving gears are rotatably mounted, wherein each coupler can rotate about an axis of its own, and the circular retaining ring, couplers and central bearing block are free to orbit concurrently about the central axis;

(f) a secondary crown plate having a central bore, the secondary crown plate being rotatable around the central axis and being connected in a driving relation to the satellite pinions in mirror image relation to the initial crown plate;

(g) a first cog wheel integrally connected to the secondary crown plate to rotate around the central axis, the first cog wheel having a central bore which is contiguous with the secondary crown plate bore;

(h) a first shaft which is rigidly connected to the output receiving gear which is adjacent to the initial crown plate, the first shaft extending through and beyond the central bore of the initial crown plate such that the initial crown plate is free to rotate around the first shaft;



(i) a second shaft which is rigidly connected to the output receiving gear which is adjacent to the secondary crown plate, the second shaft extending through and beyond the contiguous central bores of the secondary crown plate and first cog wheel such that the secondary crown plate and first cog wheel are free to rotate around the second shaft;

(j) a second cog wheel which is rigidly connected to the second shaft to rotate around the central axis;

(k) a third cog wheel which is connected in driving relation with the second cog wheel;

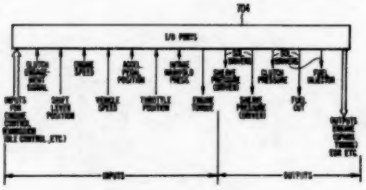
(l) a fourth cog wheel which is connected in driving relation with the first cog wheel; and

(m) a connecting axle which extends between the third and fourth cog wheels and which has ends which are rigidly connected to the third and fourth cog wheels, the connecting axle being parallel to the central axis and supportively mounted to a supporting framework; wherein the beveled pinion transmitting gears transmit to the output receiving gears a rotation output rate determined by the first stage rotary multiplication product, and the output receiving gear adjacent the secondary crown plate producing through the second shaft, the second and third cog wheels, the connecting axle, and the fourth and first cog wheels a second stage rotary multiplication product which establishes the rate of rotation of the secondary crown plate which in addition to the initial crown plate, drives the couplers through their satellite pinions.

4,700,590
SYSTEM FOR UTILIZING THE NEGATIVE TORQUE OF A POWER DELIVERY SYSTEM HAVING A CONTINUOUSLY VARIABLE RATIO TRANSMISSION FOR BRAKING

Takashi Omitsu, Davis, Calif., assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sep. 30, 1985, Ser. No. 781,504
Int. Cl.[4] B60K *41/16*
U.S. Cl. 74—857 5 Claims



1. A system for controlling the operation of a power delivery system including an engine of an engine-driven vehicle and a continuously variable ratio transmission coupled to said engine for delivering power from said engine to an output shaft, said engine having fuel delivery means for delivering a variable quantity of fuel thereto, said power delivery system being controlled by command means for commanding a desired power delivery system performance, the the system comprising:

actual system performance measuring means for measuring the actual performance of the power delivery system;

ratio control means operatively coupled to said command means and said actual system performance measuring means for controlling the ratio of said transmission as a function of the desired system performance commanded by said command means and the measured actual system performance, the speed of said engine varying as a function of transmission ratio;

fuel function means defining a desired fuel requirement for said engine in relation to engine operating speed;

speed measuring means for measuring the speed of said engine;

fuel control means operatively coupled to said fuel function means and said fuel delivery means for controlling said fuel delivery means only in accordance with the fuel requirement defined by said fuel function means, so that the fuel delivered to said engine is determined only by the speed thereof; and

fuel cutting means, separate from said fuel control means, for cutting fuel flow to said fuel delivery means below that required by said fuel function means when the system performance commanded by said command means is reduced wherein after said fuel flow is cut, said fuel control means is controlled to increase the negative torque of said system.

4,700,591
HYDRAULIC SHIFT CONTROLLER FOR AN AUTOMATIC TRANSMISSION HAVING A FIRST AND SECOND SECTION

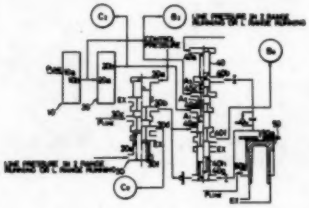
Hideki Yasue, and Kagenori Fukumura, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 22, 1986, Ser. No. 854,598
Claims priority, application Japan, Apr. 24, 1985, 60-87985
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—868 6 Claims

1. A hydraulic shift controller for an automatic transmission of a vehicle, comprising:

a first transmission section for automatically shifting gears in association with at least vehicle speed and engine load,

a second transmission section for automatically shifting between a lower gear side and a high gear side, and being arranged on a output side of the first transmission section, wherein the first transmission section and the second transmission section are selectively shifted, to thereby achieve multi-gear shifts;



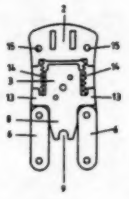
a frictionally engaging device located in said second transmission section; and

means for varying the hydraulic pressure of said frictionally engaging device for shifting the second transmission section in accordance with an output shaft torque of the first transmission section.

4,700,592
TOOL FOR CRIMPING, CUTTING, PRESSING OR THE LIKE

Reiner Rommel, Moldaustrasse 6, 3570 Stadt Allendorf, Fed. Rep. of Germany

Continuation of Ser. No. 716,645, Mar. 27, 1985. This application Aug. 20, 1986, Ser. No. 898,344
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1984, 3411397
Int. Cl.[4] B25B *7/12*
U.S. Cl. 81—355 8 Claims



1. A tool for crimping, cutting, pressing or the like having a linear work path and including a pair of gripping levers (11, 12) each pivotably connected at one end to the other by a link pin (10) and a tool head (K) mounted to the levers at their pivoted ends and a pair of lever drive members (6, 6) engaged between the gripping levers and the tool head, said tool head including two cover plates (1) is spaced parallel relationship which together form a integrally enclosed frame and which are firmly connected to one another by an intermediately located upper profile plate (2), at least one of said cover plates defining an elongated guide opening therethrough of a predetermined length extending between said upper profile plate (2) and said link pin (10) and of a predetermined width, and a lower profile plate (3) positioned between said cover plates including an open groove (9) facing said link pin, spring means (14) mounted in said tool head and urging the groove of said lower profile plate into engagement with said link pin a guide plate (16) attached to said lower profile plate and protruding into the

elongated guide opening of one of said cover plates, said guide plate (16) being of a length extending along said elongated guide opening which is shorter than the length of said elongated guide opening so that the guide plate 916) and lower profile plate (3) are movable along the length of the guide opening, said guide plate being of a width approximately the same as the width of the elongated guide opening so that the guide plate (16) and guide opening maintain the lower profile plate in a nonrotatable attitude, whereby the lower profile plate can be moved up and down by the pivotable movement of the lever drive members (6) and is guided between the two cover plate (1) by the guide opening of the guide plate (16), with the upper and lower profile plates (2,3), on the sides facing one another, forming tool elements which effect the crimping, cutting, pressing or the like, and tool head (K) can be detached from the gripping levers (11, 12) and exchanged for other tool head forms (K) without detaching the gripping levers from each other.

4,700,593

GUIDE FOR USE IN THE FEEDING OF METAL BARS TO A MACHINE TOOL

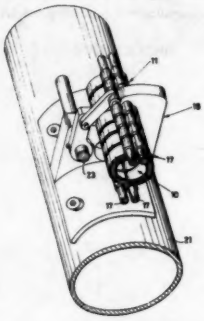
Giovanni Cucchi, Via Genova, 4, 20060 Bussero (Milano), Italy

Filed Aug. 1, 1986, Ser. No. 891,830

Claims priority, application Italy, Aug. 30, 1985, 22038 A/85; May 22, 1986, 21934/86[U]

Int. Cl.[4] B23B *13/04*

U.S. Cl. 82—2.5 **13 Claims**



1. A guide for use in a machine tool bar feeding mechanism of the type having a drum and a plurality of axially spaced bearing structures secured on said drum, comprising

a plurality of rods supported intermediate their ends on said structures parallel to the axis of said drum,

a plurality of side-by-side units mounted on said drum and each consisting of two equal and substantially semi-circular parts, one part of each of said units being fixed and the other being movable relative to said drum,

control means connected to the movable part of each of said units and operable selectively to grip a metal bar in said units, and

means connecting the opposite ends of each of said parts to a pair of said parallel rods that are held by said structures in predetermined spaced relation to each other, thereby to restrain movement of said opposite ends toward each other.

4,700,594

MULTI-SPINDLE AUTOMATIC LATHE

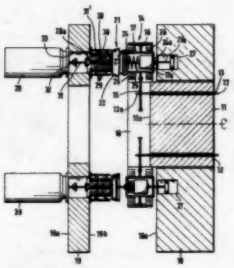
Walter Heinen, Wesseling, Fed. Rep. of Germany, assignor to Firma Alfred H. Schütte, Cologne, Fed. Rep. of Germany

Filed Aug. 15, 1986, Ser. No. 896,727

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1985, 3530860

Int. Cl.[4] B23B *9/00*

U.S. Cl. 82—3 **7 Claims**



1. In a multi-spindle automatic lathe; a spindle drum; rotary support means on which said drum is rotatably displaceable; a series of spindles mounted on the drum and adapted to receive workpieces, said spindles being disposed on a spindle circle of the drum to be indexed between working positions by said rotary displacement of the drum; a series of separate drive means in stationary positions behind the spindle drum, said drive means having output shafts; separate disengagageable clutch means between said output shafts and the spindles for connecting the drive means to the spindles when they are in their working positions, said clutch means each comprising a driving part connected to an output shaft, and a driven part connected to a respective spindle and rotatably displaceable with the spindle drum; clutch actuating means for engaging and disengaging said clutch means; said drive means and said clutch means both being disposed radially outwards of said spindle circle; and, gear transmission means carried on said drum for connecting said clutch means driven parts to respective spindles, whereby access is provided for said spindles to receive workpieces at the rear of said drum.

4,700,595

BALANCE MECHANISM FOR MOVABLE JAW CHUCK OF A SPIN STATION

Paul Soares, Belmont, Calif., assignor to Silicon Valley Group, Inc., San Jose, Calif.

Filed May 16, 1986, Ser. No. 864,078

Int. Cl.[4] B23B *31/14*

U.S. Cl. 82—40 R **11 Claims**

1. A wafer processing spin station of the kind in which a wafer, which may have a number of flats, is gripped between jaws and is rotated to relatively high speeds of rotation about a spindle axis of rotation in the course of performing a spinning operation on the wafer at the spin station, said spin station comprising,

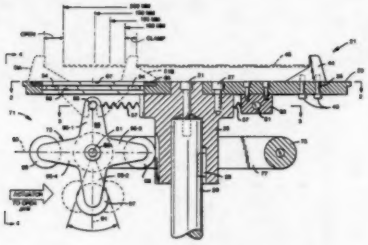
a jaw mounting plate,

a spindle connected to rotate the jaw mounting plate,

jaw means operatively associated with the jaw mounting plate for gripping the wafer on its outside edge to hold the wafer in place between the jaw means during a spinning operation,

said jaw means including at least one movable jaw chuck which is movable between an open positon and a clamping position and which is adjustable in position at the clamping position to accommodate gripping by the jaw means of

wafers whose centers are offset from the spindle axis of rotation as a result of wafer tolerance diameter variations and/or differences in the number of wafer flats and/or variations of orientations of wafter flats with respect to the locations of the jaw means, and



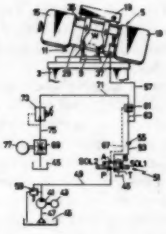
balancing means operatively associated with the movable jaw chuck and effective to maintain the gripping force exerted on the wafer by the movable jaw chuck substantially unaffected by the centrifugal forces developed by the movable jaw chuck at all speeds of rotation produced during the spinning operation and within the range of clamping positions of the movable jaw chuck.

4,700,596

METHOD AND APPARATUS FOR CONTROLLING THE FEEDING OF A BANDSAW BLADE IN BANDSAW MACHINES

Masayuki Taguchi, Hatano, Japan, assignor to Amada Company, Limited, Japan

Filed Dec. 12, 1984, Ser. No. 680,829
Claims priority, application Japan, Dec. 14, 1983, 58-234152
Int. Cl.[4] B23D *53/04, 55/04;* **B27B** *13/04, 25/00*
U.S. Cl. 83—13 **8 Claims**



1. A cutting controlling method for bandsaw machines, comprising:

continuously driving a bandsaw blade;

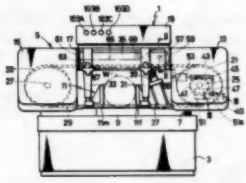
continuously feeding the bandsaw blade into a workpiece; and using a continuously operating control motor to control a flow control valve to alternate the speed at which the bandsaw blade is fed into the workpiece between fast and slow, so that the bandsaw blade is continuously periodically fed into the workpiece alternately fast and slow.

4,700,597

METHOD FOR CONTROLLING CUTTING MACHINES

Masayuki Taguchi, Hatano, Japan, assignor to Amada Company, Limited, Japan

Division of Ser. No. 607,259, May 4, 1984, Pat. No. 4,620,465.
This application May 1, 1986, Ser. No. 857,954
Claims priority, application Japan, May 6, 1983, 58-078205
Int. Cl.[4] B23D *53/04, 55/04, 55/06*
U.S. Cl. 83—13 **4 Claims**



1. A method of controlling a cutting machine having a cutting tool for cutting workpieces having different machinability characteristics comprising:

providing a plurality of predetermined constant voltage outputs, each constant voltage output corresponding to a predetermined cutting speed for the cutting tool, each constant voltage output also corresponding to a particular range of machinability characteristics;

selecting one of said plurality of constant voltage outputs based on the machinability characteristics of the workpiece to be cut by said machine;

driving the cutting tool at the predetermined cutting speed corresponding to the selected constant voltage output,

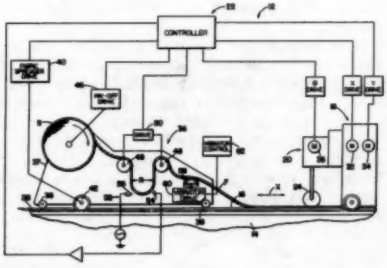
whereby the workpiece is cut at the optimum speed dependent upon its machinability characteristics.

4,700,598

METHOD FOR WORKING ON WOVEN FABRIC WOUND ON A SUPPLY ROLL

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific, Inc., South Windsor, Conn.

Division of Ser. No. 607,618, May 7, 1984, Pat. No. 4,616,543, which is a continuation-in-part of Ser. No. 284,783, Jul. 20, 1981, abandoned. This application May 16, 1986, Ser. No. 864,095
Int. Cl.[4] D06H *7/00;* **B65H** *17/46*
U.S. Cl. 83—14 **7 Claims**



1. A method for working on woven fabric wound on a supply roll and comprising the steps of paying-off fabric from the supply roll, spreading the fabric on a supporting surface as the fabric is payed-off the supply roll, vibrating an associated portion of the payed-off fabric located between the supply roll and the supporting surface at a constantly changing frequency rate including ultrasonic frequencies while the fabric is being payed-off the supply roll and spread onto the supporting sur-

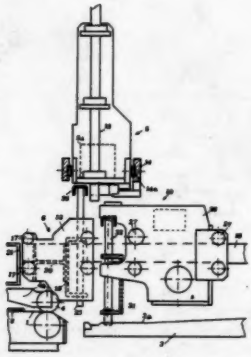
face to relax and normalize the fabric, and immediately performing a size-dependent work operation on the fabric spread on the supporting surface.

4,700,599

APPARATUS FOR REMOVING AND STACKING OF SHEET METAL STRIPS CUT BY A PLATE SHEAR

Eduard Hänni, Zofingen, and Markus Zweili, Basel, both of Switzerland, assignors to Hammerle AG, Zofingen, Switzerland

Continuation of Ser. No. 696,317, Jan. 30, 1985, abandoned. This application Jul. 10, 1986, Ser. No. 883,855
Claims priority, application Austria, Jan. 30, 1984, 295/84
Int. Cl.[4] B21D *43/22*
U.S. Cl. 83—94 **8 Claims**



1. An apparatus downstream relative to a normal transport direction from the blades of a plate shear used for cutting sheet metal strips from a sheet metal plate to remove these strips from immediately downstream of the blades of the plate shear and to stack these strips on a pile at a predetermined position also downstream of the plate shear, the apparatus comprising:

conveying means for moving the cut strip from said plate shear in said transport direction,

a supporting rake arranged downstream of said conveying means and movable horizontally at the same height as said conveying means between a receiving position directly above the pile position and an unloading position offset therefrom,

a stripper arrangement located above and cooperating with said supporting rake and engageable horizontally opposite to said transport direction with a strip on the rake,

An accelerator upstream of said stripper arrangement and engageable in said transport direction with a strip on the rake, the distance in the transport direction between said accelerator and said stripper being adjustable and fixable,

Connnection means for locking said accelerator and said stripper arrangement at a predetermined spacing in said transport direction for clasping the cut strip between said accelerator and said stripper arrangement,

displacing means for

displacing said accelerator and said stripper arrangement together with the clasped cut strip and said supporting rake toward said pile and for retaining said accelerator and said stripper together with said cut strip against horizontal movement above said pile and

displacing said supporting rake out from underneath the cut and clasped strip to the unloading position in order to stack said cut and clasped strip on said pile, and

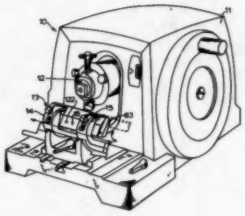
lateral centering stops movably arranged in the transverse direction on both sides of said supporting rake.

4,700,600

MICROTOME DISPOSABLE BLADE APPARATUS

John E. P. Pickett, 3323 Pinafore Dr., Durham, N.C. 27705

Filed Feb. 28, 1986, Ser. No. 834,351
Int. Cl.[4] G01N *1/06*
U.S. Cl. 83—165 **32 Claims**



1. A microtome apparatus comprising, in combination:

(a) a specimen holder mechanism including means for holding said specimen, means for applying a reciprocating motion to said specimen relative to and for cutting in a vertical plane and for positioning the specimen and holder relative to the cutting plane;

(b) a knife clamp adapted to clamp a conventional non-disposable microtome knife, said clamp being movable laterally and tiltable with respect to the specimen for appropriate precision positioning of the knife cutting edge;

(c) a substantially rectangular disposable blade of a selected uniform width and thickness, having one longitudinal edge precision sharpened to microtome knife quality for cutting and the opposed edge free of the conventional guard member, being of substantially less flexibility than the conventional double edge wafer blade while being held clamped; and

(d) a holder for said disposable blade adapted to being received and held in said conventional knife clamp, comprising:

(i) a first horizontally disposed block member having a pair of end portions with knife clamp surfaces enabling said holder to be clamped within said knife clamp and providing between said knife clamp surfaces and proximate said cutting plane a blade clamp backing surface for receiving said blade during loading in a non-curved relation and against which the cutting edge portion of one side of said blade may be fixedly held during cutting to place the cutting edge thereof in said cutting plane, each of said end portions having a slot shaped to fit and slidably receive said blade whether relatively thick or relatively thin for loading from either corrresponding end of said block member;

(ii) a blade clamping member comprising a second block member having a slight and precise amount of inward-outward movement and mounted centrally of said first block member on a rocker arm rotatable in and snugly retained by said first block member end portions, said second block member having a clamping surface mating said first block member backing surface and said movement adapting said second block member at the end of its outward movement to provide with said backing surface a central slot forming a continuation of said end portion slots to slidably receive said blade and at the end of its inward movement being adapted to contact and clamp a lengthwise extending edge portion located immediately below the sharpened cutting edge of the other opposite one side of said blade in a longitudinally tensionless free manner between said backing and clamping surfaces and to properly position the said cutting edge thereof;

(iii) opening means operative on said clamping member

when unclamped to force said clamping member outwardly; and

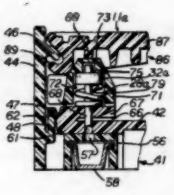
(iv) a manually operated rotatable camming member mounted on said holder, said camming member being effective when rotated in one direction to cam said second block member and pivot said second block member about the axis of said rocker arm in said slight outward movement so as to effect said central slot and release said blade for replacement and in an opposite direction to cam said second block member in said slightly inward movement against the force of said opening means so as to clamp at least said edge portion of said blade while leaving the said sharpened cutting edge precisely positioned for cutting.

4,700,601

PUNCH PIN HEAD STRUCTURE

Gary J. Simon, San Jose, Calif., assignor to Velo Bind Inc., Sunnyvale, Calif.

Filed Apr. 28, 1986, Ser. No. 856,396
Int. Cl.[4] B26F 1/14
U.S. Cl. 83—687 **1 Claim**



1. In a punch, a first plate formed with a first hole, a guide plate spaced from said first plate by a gap, said guide plate being formed with a second hole aligned with said first hole; a punch pin, said punch pin comprising a metal rod having a first end formed as a male punch and a second end, said rod formed with a groove vicinal said second end and a plastic collar molded around said rod having a protuberance substantially filling said groove and the surface of said collar closest to said first end, having a substantially flat surface perpendicular to said rod, the thickness of said collar being substantially less than the length of said rod; said punch pin being reciprocable through said first and second holes, first means engaging said second end to push said first and through said first hole to punch paper in said gap, and second means applying force to said first-mentioned surface of said collar to retract said punch pin away from said first plate, said first means compriseing a punch plate, said punch plate being formed with a slot having an edge to engage said second end of said rod and said second means comprising shoulders on said slot engaging said flat surface of said collar.

4,700,602

ELECTRONIC DRUM

Terry Bozzio, 449 S. Beverly. Ste. 102, Beverly Hills, Calif.

Filed Jul. 1, 1985, Ser. No. 750,305
Int. Cl.[4] G10H 3/14
U.S. Cl. 84—1.14 **7 Claims**

1. An electronic drum comprising:

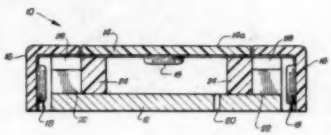
a rigid base;

first and second striking elements mounted on said base, said striking elements producing vibrations when impacted;

first and second transducer means acoustically coupled respectively to said first and second striking elements for converting said vibrations in said first and second striking elements into electrical signals;

resiliently compressible foam element means interposed between said base and said striking elements for reducing impact shock experienced by a performer when striking said striking elements and also for acoustically isolating said striking elements from one another; and

detachable fastener means interposed between said base and



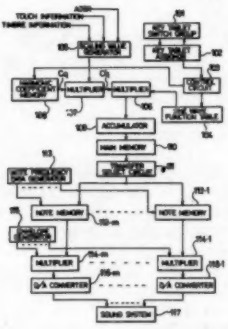
said striking elements for detachably fastening said striking elements to said base thereby permitting quick removal of said striking elements from said base when said striking elements need to be replaced.

4,700,603

FORMANT FILTER GENERATOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

Kiyomi Takauji, and Tatsunori Kondo, both of Shizuoka, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Apr. 2, 1986, Ser. No. 847,426
Claims priority, application Japan, Apr. 8, 1985, 60-073700
Int. Cl.[4] G10H 1/12, 7/00
U.S. Cl. 84—1.19 **9 Claims**



1. An electronic musical instrument which combines harmonic components corresponding to respective harmonic orders into a desired musical waveform, the desired musical waveform having a formant filter characteristic with a harmonic order (q), a cutoff harmonic order (q_c) which is below or above the harmonic order, a level (Ha), and a slope (SL), comprising:

means for generating the cut-off harmonic order (q_c) of a formant filter characteristic;

means for generating the level (Ha) of the formant filter characteristic;

memory means for storing the slope (SL) of the formant filter characteristic at an address in the memory means;

means for generating the address for reading out the slope from the memory means on the basis of the cut-off harmonic order (q_c) and the harmonic order (q);

select means for selecting one of the level (Ha) from the level generating means and the slope from the memory means in accordance with the cut-off harmonic order (q_c), the select means generating a formant filter characteristic signal therefrom; and

means for using the formant filter characteristic signal to set a component value for the harmonic order as a function of

one of the levels and slope for the formant filter characteristic.

4,700,604

MUSIC PLAYING SYSTEM

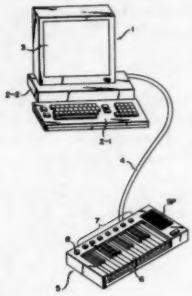
Shigenori Morikawa, and Hiroyuki Sasaki, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 657,575, Oct. 3, 1984, abandoned. This application Jan. 14, 1987, Ser. No. 6,314

Claims priority, application Japan, Oct. 6, 1983, 58-187546; Jul. 25, 1984, 59-155030

Int. Cl.[4] G10H *1/36, 7/00*

U.S. Cl. 84—1.03 **6 Claims**



1. A music playing system comprising:

a master electronic apparatus including means for generating automatic music playing data;

means coupled to the master electronic apparatus for transferring said automatic music playing data from said master electronic apparatus to a slave music playing apparatus; and

a slave music playing apparatus coupled to said master elect apparatus by said transferring means, including:

a tempo setting means for variably setting a tempo of said automatic music playing data transferred from said master electronic apparatus,

means for receiving the automatic music playing data transferred from said automatic music playing data generating means of said master electronic apparatus at a timing of transfer corresponding to the tempo set by said tempo setting means,

means for generating tones according to the received music playing data, thereby executing a musical performance at the tempo set by said tempo setting means and

a keyboard means having a plurality of performance keys which can be used for a manual musical performance at the timing when said tone generating means generate tones according to the automatic musical playing data for an automatic musical performance.

4,700,605

ELECTRONIC KEYBOARD MUSICAL INSTRUMENT WITH PORTAMENTO OR GLISSANDO PLAY FUNCTION

Junichi Minamitaka, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1985, Ser. No. 800,651

Claims priority, application Japan, Nov. 30, 1984, 59-253554

Int. Cl.[4] G10H *1/02, 7/00*

U.S. Cl. 84—1.24 **16 Claims**

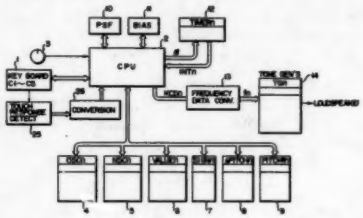
16. An electronic keyboard musical instrument with a portamento or glissando play function comprising:

keyboard means having a plurality of keys to which musical notes are assigned;

touch response detecting means coupled to said keyboard means for detecting a key depression speed of a key depressed on said keyboard means;

key code signal generating means coupled to said keyboard means for generating a key code signal corresponding to the note of a key depressed on said keyboard means; and

musical tone signal generating means coupled to said key code signal generating means for generating a musical tone signal with a pitch corresponding to the key code signal;



said key code signal generating means including play effect providing means for providing a portamento or glissando effect to the musical tone signal generated by said musical tone signal generating means, said play effect providing means being responsive to said touch response detecting means to change a portamento or glissando time in accordance with the detected key depression speed of the key depressed on said keyboard.

4,700,606

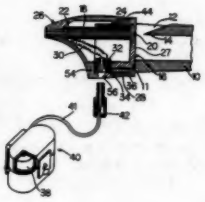
RECORDERS

Nobuo Toyama, 2-39-1 Sakuragaoka, Tama-shi, Tokyo, Japan

Filed Dec. 30, 1986, Ser. No. 947,618

Int. Cl.[4] G10D *7/02*

U.S. Cl. 84—380 C **3 Claims**



1. A recorder made of synthetic resin comprising a mouthpiece unit inside which a windway unit having a tube member defining a windway is arranged in a manner such that the outlet of the windway is positioned corresponding to the edge of a sounding window, characterized in that the tube member of the windway unit has a heating means attached thereto for heating and maintaining the windway inside the tube member to a temperature substantially the same as the temperature of the breath blown through the windway.

4,700,607

FIBER SPOOL APPARATUS

William M. Heine, Alexandria, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Filed Mar. 20, 1987, Ser. No. 28,663
Int. Cl.[4] D04C 3/18, 3/14
U.S. Cl. 87—57 11 Claims

1. A fiber spool apparatus for braiding apparatus or the like comprising:

an elongated housing having an open end;

a fiber supply spool removably mounted within said housing for rotation about an axis that is substantially parallel to the longitudinal axis of said housing;

a cap member removably mounted on said open end of said housing;

a take-up spool rotatably mounted on said cap member for rotation about an axis that is substantially perpendicular to the axis of rotation of said supply spool; said take-up spool comprising an end portion and a middle portion, and having an internal channel extending from said end portion to said middle portion thereof;

means for guiding fiber from said supply spool through said internal channel in said take-up spool, from said end portion to said middle portion thereof, so that fiber can be fed from said middle portion to the braiding apparatus; and

biasing means operatively connected to said take-up spool for maintaining a predetermined tension on the fiber being fed to the braiding apparatus to prevent slack therein.

4,700,608

MACHINE GUN

Robert Pettinga, Shelburne; Joseph Dix, Williston; Thomas O. McHugh, Burlington; Lincoln L. Sibley, Jr., Burlington; Richard T. Ziemba, Burlington, and Victor J. Forrester, Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Oct. 30, 1985, Ser. No. 793,013
Int. Cl.[4] F41F 9/00
U.S. Cl. 89—11 12 Claims

1. A machine gun comprising:

a receiver;

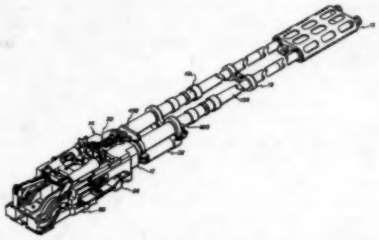
a pair of gun barrels fixed to said receiver;

a pair of operating and gunbolt mechanisms disposed in said receiver for loading, locking and firing each of said gun barrels respectively;

a rocking lever coupled to and between said operating mechanisms for driving said mechanisms 180° out of mutual phase;

said rocking lever journaled for pivotal movement about a central axis; and

external drive means coupled to said rocking lever for reciprocating said lever about said axis including



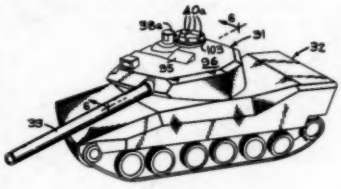
a motor having an output shaft which is coupled through an intermittent drive mechanism to a shaft fixed to said lever on said axis.

4,700,609

AUTOLOADER FOR MILITARY VEHICLE

Roger H. Wiethoff, Minnetonka, and Gary J. Nelson, Buffalo, both of Minn., assignors to FMC Corporation, Chicago, Ill.

Filed Oct. 4, 1985, Ser. No. 784,921
Int. Cl.[4] F41F 9/04
U.S. Cl. 89—46 6 Claims



1. An apparatus for selectively loading cartridges having cases into the breech of a gun mounted on a turret for pivotal movement about a generally horizontal axis relative to the turret and for rotation with the turret about a generally vertical axis, comprising:

means for pivoting the gun vertically into a 0° position;

means for locking the gun in said 0° position and unlocking the gun, which 0° position defines the only position at which cartridges are loaded into the gun and at which postion empty cases and missfired cartridges are discharged from the gun and the turret;

magazine means supporting a plurality of cartridges rigidly secured within the turret and having a load-unload opening therein in planar alignment with the gun when in said 0° position;

an endless magazine conveyor means movable within said magazine means for moving a plurality of cartridges along a predetermined path until selected cartridge is aligned with said load-unload station;

magazine-gun transfer means for gripping the selected cartridge, removing the selected cartridge from said path, and moving the selected cartridge into axial alignment with the gun only when the gun is in said 0° position;

means supported on said magazine for ramming the cartridge into the gun;

means for closing the breech of the gun;

means for firing the gun after the gun has been unlocked and aimed;

means for discharging the empty case from the gun and the turret only when the gun is in its 0° position;

independently controlled power means for actuating the above components;

means for controlling the above components to place the gun in readiness to be fired within five seconds; said cartridges include cases, explosive charges, and projectiles;

means defining a cartridge discharge opening in said turret in alignment with the gun only when the gun is in said 0° position through which empty cartridge cases are discharged;

telescopic empty case eject means in said turret having a fixed portion secured to said turret and a telescopic portion reciprocated between a retracted position and an extended case receiving position bridging the space between the breach of the gun and said cartridge discharge opening, said empty case eject means being in alignment with the gun and said case discharge opening when said gun is in said 0° position;

means defining a breech block in said gun;

said independently controlled power means being effective to actuate said telescopic empty case means and said breech block means; and

said control means being responsive to activate said power means and to extend said telescopic empty case eject means and open said breech block.

4,700,610

CYLINDER TUBE STRAIN MEASUREMENT FEEDBACK FOR PISTON POSITION CONTROL

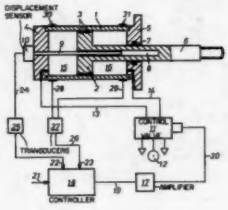
Friedrich Bauer, and Herbert Kühnelt, both of Vienna, Austria, assignors to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed Sep. 16, 1985, Ser. No. 776,587

Claims priority, application Austria, Sep. 17, 1984, 2943/84

Int. Cl.[4] **F15B** *13/16*

U.S. Cl. 91—390 **3 Claims**



1. In a fluid cylinder which includes a cylinder and a cooperating piston, said cylinder including cylinder tube and opposite first and second end covers, said second end cover including a bore therethrough and a rod gasket extending inwardly of said bore; said piston including a piston head which is slidingly movable within said cylinder tube and a piston rod which is connected to said piston head and extends through said bore in said second end cover so as to contact said gasket therein, said piston head including at least one piston seal gasket which contacts said cylinder tube, said piston head defining a first pressure chamber in said cylinder between said piston head and said first end cover and a second pressure chamber between said piston head and said second end cover, a method for maintaining the piston head at a predetermined position along said cylinder tube, said method comprising the steps of

(1) sensing the axial force of said cylinder tube acting toward said first end cover due to the frictional force acting thereon by said piston seal gasket(s) and said rod gasket prior to movement of said piston within said cylinder tube,

(2) sensing the axial force of said cylinder tube acting toward said second end cover due to the frictional force acting thereon by said piston seal gasket(s) and said rod gasket prior to movement of said piston within said cylinder tube,

(3) comparing the sensed axial forces in steps (1) and (2) to determine which force is larger and thus determine in which axial direction within said cylinder said piston head is about to move, and

(4) supplying pressure medium to either said first pressure chamber or said second pressure chamber to normalize said sensed forces and thereby maintain said piston head in its predetermined position along said cylinder tube.

4,700,611

PNEUMATIC CYLINDER MOTOR WITH END-OF-TRAVEL CUSHIONING MECHANISM

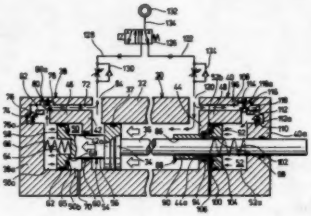
Junya Kaneko, Sohka, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,059

Claims priority, application Japan, Sep. 17, 1983, 58-144133[U]

Int. Cl.[4] **F15B** *15/22, 11/00;* **F01B** *11/02;* **F16F** *9/48*

U.S. Cl. 91—405 **9 Claims**



1. A pneumatic cylinder with a cushioning mechanism, comprising:

(a) a cylinder body having a first cushioning chamber at one end thereof and a second cushioning chamber at an opposite end thereof, said cylinder body having first and second inlet/outlet ports at the ends thereof, respectively, said first inlet/outlet port and said first cushioning chamber communicating with each other through a first air passage, said second inlet/outlet port and said second cushioning chamber communicating with each other through a second air passage:

(b) a piston slidably movable in said cylinder body;

(c) a first cushioning member displaceably mounted in said first cushioning chamber and extending toward said piston for being pushed thereby;

(d) a second cushioning member displaceably mounted in said second cushioning chamber and extending toward said piston for being pushed thereby;

(e) an air supply connected to said first and second inlet/outlet ports through a common directional control valve;

(f) a first valve body disposed in said first air passage for adjusting an air pressure from said air supply and supplying the adjusted air pressure into said first cushioning chamber to displace said first cushioning member;

(g) a second valve body disposed in said first air passage for discharging compressed air from said first cushioning chamber to said first inlet/outlet port when the pressure of air compressed in said first cushioning chamber by said first cushioning member displaced by being pushed by said piston exceeds a predetermined level;

(h) a third valve body disposed in said second air passage for adjusting an air pressure from said air supply and supplying the adjusted air pressure into said second cushioning chamber to displace said second cushioning member;

(i) a fourth valve body disposed in said second air passage for discharging compressed air from said second cushioning chamber to said second inlet/outlet port when the pressure of air compressed in said second cushioning chamber by said seocnd cushioning member displaced by being pushed by said piston exceeds a predetermined level; and

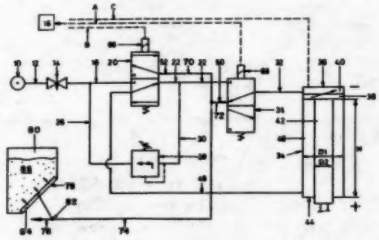
(j) respective disk members integral with said first and second cushioning members, respectively, dividing each of said first and second cushioning chambers into two chambers, each of said disk members having a passage providing communication between said two chambers.

4,700,612

ELECTROPNEUMATIC DRIVE SYSTEM FOR CRUST BREAKING DEVICES AND PROCESS FOR OPERATING THE SAME

Hans Pfister, Duebendorf, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 602,698, Apr. 23, 1984, Pat. No. 4,606,257. This application Mar. 17, 1986, Ser. No. 839,980
The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.
Int. Cl.[4] F15B *15/22*
U.S. Cl. 91—471 10 Claims



1. A process for operating an electropneumatic drive system which is fed compressed air from a compressed air network for operating an electropneumatic drive system for crust breaker devices for fused salt aluminum reduction cells which comprises:

providing a compressed air network in fluid communication with a slide valve which in turn is in fluid communication with an operatively connected to a 5/2 channeling valve downstream from said slide valve, a pressure reducing valve in fluid communication with said slide valve downstream from said network and parallel to said 5/2 valve, and a 3/2 channeling valve downstream from both said 5/2 valve and pressure reducing valve and in fluid communication therewith;

providing a working cylinder operatively connected to said network and downstream from said 3/2 valve including a cylinder head, piston and piston rod and a positive side penetrated by the piston rod and a negative or working side;

connecting the working cylinder in fluid communication on the negative side to the 3/2 channeling valve and on the positive side to the 5/2 channeling valve;

feeding a control signal via a microprocessor to the 3/2 valve in the resting postiion to evacute said negative side whereby a closed circuit is formed between the 3/2 valve and the working cylinder and thrust is provided to the piston; and

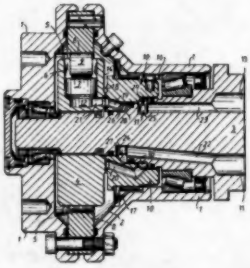
cancelling said control signal after the end position of the piston stroke has been reached.

4,700,613

HYDRAULIC MOTOR WITH STATIONARY AXLE AND ROTATING FLUID DISTRIBUTOR

Ossi Tiljander, Iisalmi, Finland, assignor to Oy Partek AB, Finland

Continuation of Ser. No. 678,713, Dec. 6, 1984, abandoned. This application Aug. 22, 1986, Ser. No. 900,253
Claims priority, application Finland, Dec. 7, 1983, 834477
Int. Cl.[4] F01B *1/06*
U.S. Cl. 91—485 4 Claims



1. A hydraulic motor, comprising:

a surrounding rotatable frame casing;

a stationary internal cylinder block with radially arranged cylinders and a stationary axle of the hydraulic motor attached thereto;

pistons reciprocating in the cylinders and bearing the inner surface of the frame casing, said inner surface being formed as a running surface guiding the movement of the pistons;

feed and exhaust channels for the hydraulic fluid;

a fluid distributor mounted around the axle to rotate together with the frame casing, for the distribution of the hydraulic fluid from said feed channel in the stationary axle into cylinder chambers and away therefrom to said exhaust channel in the stationary axle via openings provided in the cylinder block;

at least two ring-shaped spaces provided between the rotatable fluid distributor and the stationary axle thereby forming a rotatable interface between the stationary axle and the fluid distributor, said spaces being formed in the feed and exhaust channels for the hydraulic fluid, said ring-shaped spaces being formed by stepwise formations in counter surfaces of the fluid distributor and the axle, a first ring-shaped space being formed between a first stepped surface of the fluid distributor and a first stepped counter surface of the axle, a second ring-shaped space being formed between a second stepped surface of the fluid distributor and a second stepped counter surface of the axle; and

the area of the end counter surface facing the cylinder block in the ring-shaped spaces being so dimensioned that the force caused by the hydraulic fluid in the ring-shaped spaces presses the fluid distributor against the cylinder block compensating for the force separating the fluid distributor and the cylinder block.

4,700,614

STRIP VENTILATOR

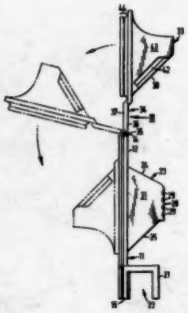
Henryk Dudzik, Mansfield, England, assignor to R. W. Simon Limited, Torrington, England

Filed Feb. 12, 1986, Ser. No. 828,893

Claims priority, application United Kingdom, Feb. 19, 1985, 8504205

Int. Cl.[4] E06B 7/082

U.S. Cl. 98—98 12 Claims



1. Ventilating apparatus (10) mounted on a glazed panel (58) or the like and being in the form of a series of at least two elongate components (10, 59, 60), each elongate component comprising a body portion (11) having an inlet (39) for the passage of air therethrough, a locating device means (21) for engaging a glazed panel (58) and cowl (23) for controlling flow of air to the inlet (39) characterized in that the body portion (11) is provided with connecting means (17, 18) for connecting the body portion (11) to an identical body portion of another, identical elongate component (10, 59, 60) whereby the components (10, 50, 60) extend end to end in series, the connecting means (17, 18) of the body portion (11) being provided with a formation (19, 20) which, when connected with the said other body component (10, 59, 60) provides a capillary break (79) which prevents ingress of liquid by capillary action.

4,700,615

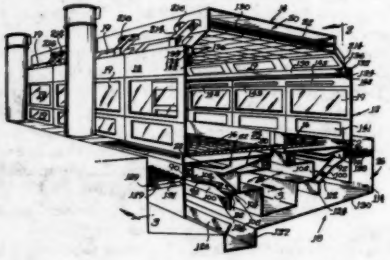
SPRAY BOOTH

Stanley C. Napadow, Elgin, Ill., assignor to Protectaire Systems Co., Elgin, Ill.

Filed Jan. 3, 1986, Ser. No. 816,144

Int. Cl.[4] B05B 15/12

U.S. Cl. 98—115.2 23 Claims



20. In a bottom draft spray booth, the combination for removing air borne particles comprising:

walls defining a interior spray area,

an air permeable floor beneath the spray area with air carrying particulates through the floor.

a pair of sloping subfloors sloping toward each other and defining an air slot therebetween,

means for directing water to flow across the air slot to form a first water curtain through which the air must flow so that particulates are wetted in the first water curtain,

walls defining the slot causing the air velocity to increase substantially when flowing through the slot,

a precipitation chamber having a substantially larger area than said slot to reduce substantially the velocity of the entering air from the slot,

means in the precipitation chamber to change the direction of air and water flow,

means creating a second water curtain through which the changed direction air flows to again wet particulates,

baffle means creating a third water curtain below the separation chamber and a second air slot,

means for deflecting the air and water to change their respective directions of flow before air flows through the second air slot to cause air and water turbulence to wet particulates,

baffle means creating a third slot and for directing water across the slot to form a fourth water curtain across the third slot,

means to deflect the air to change its direction of flow before the third slot to cause air and water turbulence to form a spray through which the air passes before flowing through said fourth water curtain and the third slot,

means defining a fifth water curtain through which the air must flow,

a precipitation chamber of substantially greater area than the third slot to drop substantially the velocity of the air borne particulates and of the air flowing in to the precipitation chamber, and

exhaust means for exhausting the air cleaned of particulates from the spray booth.

4,700,616

PISTON AND CYLINDER UNIT

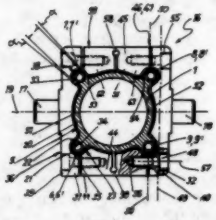
Kurt Stoll, Lenzhalde 72, 7300 Esslingen, and Gerhard Hihn, Schurwaldstr. 7, 7300 Esslingen-Berkheim, both of Fed. Rep. of Germany

Filed Sep. 22, 1986, Ser. No. 910,394

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3534000

Int. Cl.[4] F15B 15/20

U.S. Cl. 92—118 20 Claims



1. A cylinder and piston unit comprising a cylinder tube, two cylinder end caps each placed on one end of the cylinder tube, a piston able to run inside the tube axially, a piston rod fixed to said piston and extending at one side of said piston and out of said cylinder through at least one of said end caps in a sealing manner, four longitudinal means extending along said cylinder and piston unit between said end caps and being equally spaced from each other in the circumferential direction of said tube, and mounting yoke means for pivotally supporting said tube, said mounting means comprising:

at least first and second clamping jaws which are diametrally opposite to each other with respect to the cylinder tube, each of said clamping jaws having two gripping faces for engaging two of said longitudinal means that are circumferentially adjacent, said clamping jaws forming a structure placed round said tube clear of surfaces of said tube between said longitudinal means,

two trunnions mounted on respective different ones of said first and second clamping jaws so as to define a pivot axis normal to a longitudinal axis of said tube and to afford a way of pivotally mounting said cylinder and piston unit,

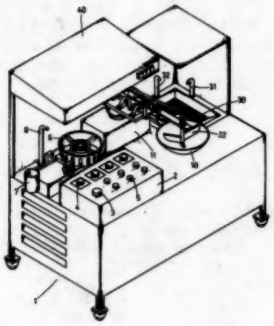
and means for connecting said clamping jaws and tightening same onto said longitudinal means so that the two gripping faces of each of the clamping jaws are simultaneously clamped onto outer surfaces of two of said longitudinal means which are adjacent to each other in the circumferential direction of the tube.

4,700,617

AUTOMATIC FRYING MACHINE

Yu-Chuan Lee, 8280 Carburton St., Long Beach, Calif. 90808, and Wu-Long Lee, 2255 Moon View Dr., Hacienda Heights, Calif. 91745

Filed Mar. 24, 1986, Ser. No. 842,820
Int. Cl.[4] A47J *27/00*
U.S. Cl. 99—327 **8 Claims**



1. An automatic food preparation apparatus, especially for preparing Chinese dishes, characterized by being capable of operating a substantially continuous processing sequence including the unit operations of material feeding, frying and similarly heating received material, serving prepared food onto dishes and washing the respective pan, said apparatus comprising, in combination:

(a) a base

(b) individual outlet means for water, heat and motive power, said outlet means mounted in said base, with each outlet being respectively conneted to a source of water, a source of heat and a source of motive power;

(c) a control cluster supported on said base and which includes at least a main switch, a plurality of timers and a plurality of sequence switches;

(d) a feeder mechanism arranged on said base and adapted to bring food from a receiving location to the heat outlet means for cooking and frying in such a way that foodstuff is displaced through an arc of 180° and then can fall into a respective pan due to gravity;

(e) a stirring mechanism arranged on said base, said mechanism including a stirrer comprised of a plurality of blades, a flexible rotatable shaft having a first end and a second end with said stirrer being connected to the first end of said flexible rotatable shaft, and a pneumatic piston and cylinder unit operatively connected to the second of said flexible rotatable shaft for imparting stirring motions to said shaft and said stirrer;

(f) a first shaft having a first end and a second end, with the respective pan being operatively connectable to the first, forward, end of said first shaft;

(g) a pneumatic piston and cylinder unit operatively connected to the second of said first shaft for imparting turning motions to the pan thereby to remove prepared food from the pan;

(h) a shaft block for mounting thereon said pneumatic piston and cylinder unit for said first shaft and for mounting thereon said pneumatic piston and cylinder unit for said second shaft;

(i) a second shaft rotatable in both normal, forward, and reverse directions, said second shaft having a first end and a second end, with said shaft block being connected to said first end of said second shaft;

(j) a pneumatic piston and cylinder unit operatively connected to the second end of said second shaft for imparting laterally swinging motions to said second shaft for displacement of said stirring mechanism and the respective pan supported at the forward end of said first shaft from the outlet means of heat to the outlet means for water at a respective sink;

(k) a sink for washing the pan; and

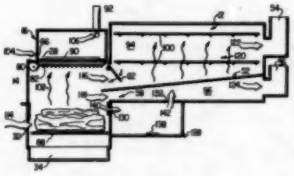
(l) water injectors alongside said sink to inject water automatically when washing the pan while stirring motion is imparted to said stirrer.

4,700,618

MEAT SMOKER

David M. Cox, Jr., 1522 N. Hardrock Rd., Irving, Tex. 75061, assignor to David M. Cox, Jr., Irving, Tex.

Filed Aug. 6, 1985, Ser. No. 762,957
Int. Cl.[4] A21B *1/24*; A47J *37/04*; A23B *4/04*
U.S. Cl. 99—339 **14 Claims**



1. A meat smoker comprising:

a fire box;

a smoking chamber vertically and laterally offset from said fire box;

a heating chamber positioned below said smoking chamber and adjacent to said fire box, said heat chamber being open to said fire box to receive heated air from said fire box;

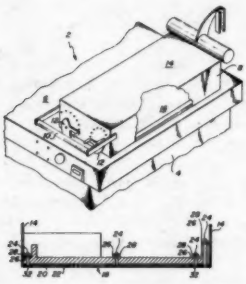
a drain pan separating said smoking chamber and said heating chamber, a portion of said drain pan extending into said fire box, and said drain pan being of such material and thickness to facilitate a transfer of heat from said heating chamber to said smoking chamber; and

an adjustable damper connecting said smoking chamber with said fire box for controlling the flow of smoke and heated air from said fire box into said smoking chamber.

4,700,619
REMOVABLE COOKING SURFACE FOR THE MOVABLE PLATEN OF A TWO-SIDED COOKING DEVICE

John M. Scanlon, Louisville, Ky., assignor to Vulcan-Hart Corporation, Louisville, Ky.

Filed Oct. 30, 1986, Ser. No. 925,282
Int. Cl.[4] A47J *37/06*
U.S. Cl. 99—349 **9 Claims**



1. An improved cooking surface assembly for the upper movable heated platen of a two-sided cooking device, comprising

(a) a planar plate having a generally rectangular vertical cross-sectional configuration, said plate being formed of a rigid heat conducting material and having a thickness less than the thickness of the platen;

(b) a layer of synthetic plastic material connected with the lower surface of said plate, said material resisting adhesion of a food product being cooked by the two-sided cooking device; and

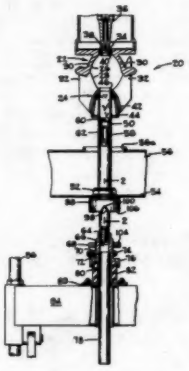
(c) means for removably connecting said plate with the platen, said plate extending continuously over and in contiguous relation with the lower surface of the platen while being rigidly and securely affixed thereto to afford uniform maximum heat transfer from the heated platen to the cooking surface of the synthetic plastic material via the rigid plate, whereby when the movable platen is lowered to a position parallel to and spaced from a fixed grill of the cooking device with a food product being arranged between the platen and the grill, heat from the platen will be uniformly transmitted through said plate and said layer to assist in cooking the food product and when the upper platen is lifted away from a lower grill surface following cooking of the food product, said layer of synthetic plastic material prevents the ood product from adhering thereto.

4,700,620
CITRUS JUICE EXTRACTOR

Stephen D. Cross, Lakeland, Fla., assignor to FMC Corporation, Chicago, Ill.

Filed Feb. 10, 1986, Ser. No. 827,581
Int. Cl.[4] A23N *1/02;* **B30B** *9/02*
U.S. Cl. 99—510 **3 Claims**

1. An appartus for extracting juice from a whole citrus fruit of the type having opposed hemispherical cups of the character disclosed movable toward each other and in which a fruit is contained in one of the cups, said apparatus comprising means for cutting diametrically opposed generally circular portions from the rind as the cups move toward each their compressing the fruit therebetween, means carried by one of said opposed cups and in communication with the interior of the fruit for establishing a juice flow path to a juice collecting device, said flow path establishing means including an elongate aperture tubular member to allow passage of juice, means reciprocally mounted within said apertured tubular member for retaining said circular portions of the rind, said retaining means carried by a solid tubular member and maintaining the circular portions in a plane normal to the axis of said apertured tubular member, means for reciprocating the retaining means carried by said solid tubular member in synchronism with

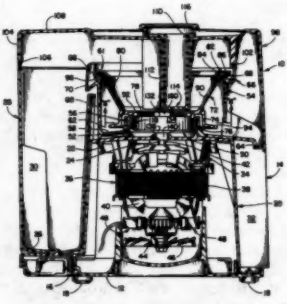


movement of the cups toward and away from each other, and means responsive to pressure resulting from compression of the fruit, against said circular portions carried by said retaining means for displacing said solid tubular member relative to said apertured tubular member.

4,700,621
JUICE EXTRACTOR QUICK CONNECT/DISCONNECT COUPLING

John H. Elger, Milwaukee, Wis., assignor to Sunbeam Corporation, Downers Grove, Ill.

Filed Oct. 14, 1986, Ser. No. 917,932
Int. Cl.[4] A23N *1/02;* **F16D** *1/00*
U.S. Cl. 99—511 **10 Claims**



1. A juice extractor comprising a rotatable inverted conical filter basket, a motor drive, a drive coupling means at the lower end of said basket for connecting and disconnecting said basket to and from said motor drive, coupling means including a drive assembly secured to said motor drive, a depending coaxial circular wall formation on said filter basket defining a circular recess adapted to receive said drive assembly which is secured to the upper end of a motor drive shaft, the inner surface of said wall formation being provided with a series for circumferentially spaced vertically extending slots having

vertically disposed side edges and upwardly and outwardly inclined bottom edges, said drive assembly being generally circular in configuration and having top and bottom walls and a side wall having a series of equidistantly and circumferentially spaced vertical slots formed therein, radially disposed drive slugs slidably mounted in said drive assembly and biased outwardly through each of said slots for latching and driving engagement in one of said filter basket slots, vertically disposed side surfaces of said drive slugs at the outer ends thereof for torque-transmitting driving engagement with said vertically disposed side edges of said filter basket slots, upper and lower corners of the slot-engaging outer ends of said drive slugs being vertically beveled to define camming surfaces which engage said circular wall formation to displace said slugs inwardly upon connection and disconnection of said filter basket to and from said drive assembly.

4,700,622

APPARATUS FOR COMPRESSING AND SOLIDIFYING FIBROUS MATERIALS OF PLANTS

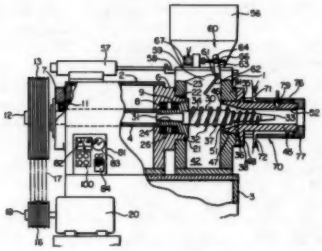
Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Aug. 19, 1986, Ser. No. 898,123

Claims priority, application Japan, Aug. 20, 1985, 60-183582

Int. Cl.[4] B30B *3/02, 15/30, 15/34*

U.S. Cl. 100—45 **11 Claims**



11. An apparatus for compressing and heating a material to be treated, i.e., fibrous materials of plants, changing the quality of the material, and solidifying the same, said apparatus comprising:

a rotaatable screw having an upstream and a downstream end;

tubular forming means disposed around said screw and cooperating with the same to define therebetween a quality-changing chamber;

feeding means for feeding the material to be treated to the upstream end of said screw;

heating means associated with said tubular forming means to heat the material to be treated within said quality-changing chamber so as to maintain the temperature of the material within said quality-changing chamber so as to maintain the temperature of the material within said quality-changing chamber at a predetermined value during the operation of the apparatus, said heating means comprising a plurality of heating elements which are independent of each other, some of said heating elements having a heat capacity different from that of the remaining heating elements;

electric motor drive means drivingly connected to said screw to rotate the same to deliver the material fed from said feeding means, to said quality-changing chamber while compressing the material, to cause the material to be delivered through said quality-changing chamber toward the downstream end of said screw while the material is heated by said heating means, to thereby allow the material to be gradually changed in quality and solidifed due to the compression by said screw and the heating by said heating means during the passage of the material through said quality-change chamber;

sensor means for sensing a load applied to said electric motor, said load varying in dependence on the load applied to said screw, to generate a signal;

control means responsive to the signal from said sensor means, said control means comprising setter means for setting a predetermined load value, comparator means connected to said sensor means and said setter means for comparing the load value set by said setter means with a signal from said sensor means to generate a signal, and control circuit means connected to said comparator means and responsive to the signal from said comparator means to generate an operation signal;

regulating means operative in response to the operation signal from said control means to regulate the flow rate of the material to be treated fed from said feeding means to the upstream end of said screw.

4,700,623

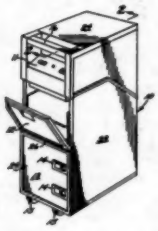
AIRCRAFT TRASH COMPACTOR

James L. Durbin, Valencia, and Robert M. Clemens, Newhall, both of Calif., assignors to A.K.G.S. Partnership, A Partnership of Las Vegas, Las Vegas, Nev.

Filed Sep. 26, 1985, Ser. No. 781,391

Int. Cl.[4] B30B *15/16*

U.S. Cl. 100—52 **19 Claims**



1. A trash compactor, comprising:

a. a housing having a support frame;

b. a trash compacting chamber within said housing adapted to receive a disposable, self supporting trash container having walls and a bottom and provided with containment walls and flooring which support the walls and bottom of disposable, self-supporting trash container disposed therein;

c. loading means to direct trash into disposable, self-supporting trash containers disposed within the compacting chamber;

d. extendible ram drive means disposed within the interior of said housing and supported at one end thereof by the support frame in an upper portion of the housing and having a compacting ram at the other end thereof;

e. power means to extend the ram drive means to drive the compacting ram into a disposable, self-supporting trash container disposed within the compacting chamber to compact trash therein;

f. power means to retract the ram drive means;

g. power control means to terminate the extension of the ram drive means and to retract the ram drive means when the compacting pressure applied by the ram to trash therein exceeds a predetermined pressure; and

h. displacement means which is actuated upon the retraction of the ram drive means to effect relative movement between a trash container disposed within the compacting chamber and one of the containment walls or the flooring of the compacting chamber to thereby loosen the frictional engagement which builds up therebetween from the

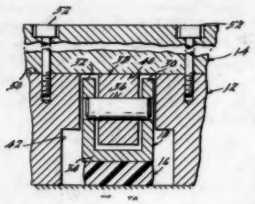
compaction of trash therein so that the trash container can be readily removed from the compacting chamber.

4,700,624

DIE TRANSFER SYSTEM

William P. Murphy, 1067 Kennessw Ave., Birmingham, Mich. 48008

Filed Jul. 10, 1986, Ser. No. 884,077
Int. Cl.[4] B30B *15/02*
U.S. Cl. 100—224 **1 Claim**



1. A die transfer system for a press comprising a bolster having a horizontal die support surface with a slot therein having a horizontal bottom surface, said die transfer system comprising

an elongated, horizontally extending vertically movable rail disposed in the slot in said press bolster, said rail having a horizontal bottom surface,

a roller on said rail for directly supporting a die,

a solid elastomeric spring element having a horizontal upper surface engageable with the bottom surface of said rail and a horizontal lower surface engageable with the bottom surface of said slot, said elastomeric spring element having a vertical dimension, durometer and elastic memory coefficient such that a die supported on the roll of said rail is normally biased to a die transfer condition above the die support surface of said bolster, and

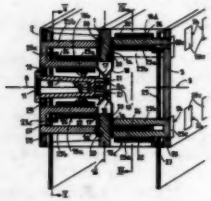
means for biasing said die downwardly into engagement with said bolster so as to subject said elastomeric spring element solely to vertical compression while maintaining the upper and lower surfaces thereof in parallel relation, release of said biasing means effecting elevation of said rail, rollers and die to said die transfer condition due solely to elastic memory of said element.

4,700,625

NEEDLE-CARRYING HEAD FOR A PRINTING MACHINE

Eric Bauer, Neuchatel, Switzerland, assignor to Caracteres S.A., Neuchatel, Switzerland

Filed Oct. 16, 1985, Ser. No. 787,962
Claims priority, application Switzerland, Oct. 30, 1984, 5179/84
Int. Cl.[4] B41J *3/12*
U.S. Cl. 101—93.05 **2 Claims**



1. In a needle-carrying head for a printing machine which head includes a bank of rectilinearly movable needles arranged in a common plane and having front and read ends, a printed circuit board having conductive tracks thereon, electromagnetic means driving each of the said needles respectively, said electromagnetic means constituting banks of electromagnets, each of the electromagnets including a bobbin, a wire coil on the bobbin and a core portion for mounting the bobbin, the wire coil having ends capable of being electrically connected to a selected one of the conductive tracks, said banks of electromagnets arranged in four groups, including a first group having members thereof disposed in front of a plane taken perpendicular to the needles, a second group arranged substantially parallel with respect to the members of the first group, members of the second group being arranged rearward of said perpendicular plane, selected ones of the first and second groups forming a third group, members of which are disposed above a horizontal plane passing through the axes of the needles and selected ones of the first and second groups forming a fourth group, members of which are disposed below the said horizontal plane; levers of the first and third order type respectively, the levers of the first order type and the levers of the third order type disposed for operation by ones of said electromagnet group, those of the electromagnets of the first group being arranged to act on the needles through the intermediary of said levers of the third order type while those of the electromagnets situated rearward of said perpendicular plane being arranged to act on the needles through the intermediary of said levers of the first order type; the improvement comprising:

an open framework for containing said electromagnet means and the levers, the needles and said printed circuit board mounted within said open framework, said open framework including a pair of parallel end plates, a center plate arranged between and parallel to said end plates including supporting pillars extending from both sides of said center plate with said end plates mounted thereto, the core portions being mounted on said end plates directed toward the center plate, a needle carrier for supporting said bank of needles and mounted to one of said end plates, said bank of needles extending toward said center plate, the rear ends of said needles being interior of said framework proximate said levers, and spacer means bridging the end plates and center plate and secured thereto, said printed circuit board being disposed between send end plates and the adjacent electromagnets, said levers being mounted to said center plate, each of said levers having a free end portion disposed proximate the respective rear ends of said needles, means on said center plate for establishing a fulcrum for said levers for the rocking of each of said levers on its respective fulcrum causing said free ends to act on the respective selected needle when the lever thereof is pivoted about its fulcrum upon energization of the selected electromagnet, each of said bobbins has ear formations at one end thereof and pin means for connecting said coil ends to the respective conductive track on the printed circuit board via said ear formations, resilient means at the rear ends of each needle for biasing same toward said lever end portions, energization of said electromagnets during said end portion against said bias moving said needle longitudinally in outward direction of said front plate.

4,700,626

REVERSING GRIPPER OF ONE SIDE AND PERFECTING PRINTING PRESS

Masayuki Iwamoto; Setsuo Araki, and Yasuo Sone, all of Shizuoka, Japan, assignors to Shinohara Machinery Co., Ltd., Shizuoka, Japan

Filed Feb. 24, 1986, Ser. No. 833,325
Int. Cl.[4] B41F *21/20, 3/40*
U.S. Cl. 101—230 **3 Claims**

1. A reversing gripping apparatus for a one side and perfecting printing press, said printing press comprising a first impres-

sion cylinder and a second impression cylinder and a reversing cylinder for transferring a sheet of paper from said first to said second cylinder, said reversing cylinder having substantially half the diameter of said first and second cylinders, said gripping apparatus comprising;

a channel formed in the circumference of said reversing cylinder and parallel to the axis thereof;

a common shaft rotatably mounted in said channel;

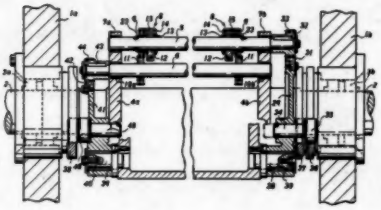
a master gripper mounted on said shaft for rotation therewith,

said master gripper having a gripping tip;

a gripper pad fixedly mounted to a side wall of said channel;

first means for rotating said shaft to grip a front edge of said sheet of paper between said gripping tip of said master gripper and said gripper pad during one side printing;

an auxiliary gripper rotatably mounted on said shaft and having a gripping tip opposed to and a width narrower



than said gripping tip of said master gripper, said gripping tip of said auxiliary gripper being recessed in a space in said gripper pad substantially parallel to a depth of said side wall;

second means operable only during perfecting printing and separate from said first means, for rotating said auxiliary gripper independent of said master gripper, for gripping a rear edge of said sheet of paper between said gripping tip of said auxiliary gripper and said gripping tip of said master gripper, said first means rotating said master gripper and said second means rotating said auxiliary gripper as said reversing cylinder rotates so that said gripping tip of said auxiliary gripper is recessed in said space and said rear edge of said sheet of paper is gripped between said gripping tip of said master gripper and said gripper pad;

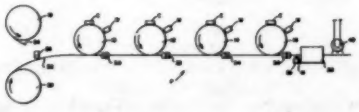
whereby said sheet of paper is delivered to said second cylinder by said master gripper and said gripping pad with increased registration accuracy.

4,700,627

METHOD AND APPARATUS FOR MARKING DEFECTIVE PORTIONS OF A PRINTED WEB

Andrew J. Hagler, Rochester, N.Y., assignor to Case-Hoyt, Rochester, N.Y.

Filed Jan. 28, 1986, Ser. No. 823,202
Int. Cl.[4] B41F *3/42*
U.S. Cl. 101—426 **21 Claims**



1. The method of marking defective web portions with a web marker operated by a controller to permit easy sorting, comprising the steps of:

(a) signaling to a controller detection of a defective web portion by means of a manual or an automatic operator;

(b) instantaneously operating a web marker and continuing to operate said marker for a predetermined time so that said marker marks the web when said controller is signaled by said automatic operator; and,

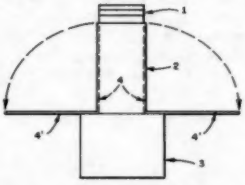
(c) delaying operation of said web marker for a predetermined period sufficient to permit the defective portion to be juxtaposed with said marker when said controller is signaled by said manual operator and continuously marking the defective web portion thereafter by operation of said marker means until web containing no defect is juxtaposed with said marker after said manual operator signals to said controller that a defect is no longer being detected.

4,700,628

SMOKE GRENADE

Kjell O. Varmo, Raufoss, Norway, assignor to A/S Raufoss Ammunisjonsfabrikker A/S, Raufoss, Norway

PCT No. PCT/NO86/00029, § 371 Date Dec. 1, 1986, § 102(e) Date Dec. 1, 1986, PCT Pub. No. WO86/06468, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 14, 1986, Ser. No. 945,096
Int. Cl.[4] I42B *13/44*
U.S. Cl. 102—33.4 **1 Claim**



1. Smoke grenade comprising a launching device (1), an instantaneous smoke charge device (2) and an IR-smoke generator (3) and in which the smoke grenade during its flight is provided with guiding-supporting fins (4'), characterized in that the instantaneous smoke charge (2) is housed in a tubelike body (4) provided with a number of slots or weakenings which when the smoke charge (2) explodes, will unfold and form the guiding/supporting fins (4').

4,700,629

OPTICALLY-ENERGIZED, EMP-RESISTANT, FAST-ACTING, EXPLOSION INITIATING DEVICE

David A. Benson, and Glenn W. Kuswa, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 2, 1986, Ser. No. 859,165
Int. Cl.[4] F42C *19/08*
U.S. Cl. 102—201 **15 Claims**

1. An EMP-resistant, fast-acting device, energized and controlled by an external source of optical energy for exploding a quantity of explosive material for providing explosive force to an external object, comprising:

a housing, provided with a containment space extending to an outer surface of said housing for containing a quantity of explosive material adjacent said outer surface;

an optically energizable circuit contained in said housing,in communication with said explosive material, said circuit comprising:

first energy transducer means for converting a first quantity of optical energy into stored electrical energy; and

optically-responsive energy release means for converting said stored electrical energy into an energy pulse to actuate said explosive material in response to a second quantity of optical energy; and

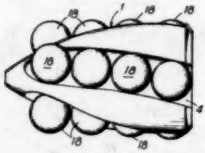
optical coupling means, optically coupling said circuit to said external source of optical energy, for transmission of said first and second quantities of optical energy from said external source to said first energy transducer means and said energy release means, respectively.

4,700,630

AMMUNITION ROUND

Leroy J. Sullivan, Huntington Beach, Calif., assignor to Branscomb Corporation N.V., Curacao, Netherlands Antilles

Division of Ser. No. 621,735, Jun. 18, 1984, Pat. No. 4,664,866.
This application Aug. 29, 1986, Ser. No. 902,297
Claims priority, application European Pat. Off., Jun. 22, 1983, 83106054.6; Jan. 13, 1984, 84100331.2; Jun. 13, 1984, 84106760.6
Int. Cl.[4] F42B *11/00*
U.S. Cl. 102—439 **6 Claims**



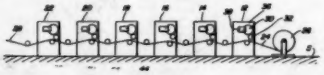
1. An ammunition round comprising: a casing for containing a propelling charge; a substantially full bore diameter slug having a substantially conical taper over substantially its entire length which has a plurality of full length grooves in its outer surface extending generally longitudinally of the slug; and a plurality of spherical bodies arranged in rows in each of the grooves and having a diameter to support and stabilize said slug in a barrel through which it is fired and to prevent it from tilting off-axis.

4,700,631

INK FOUNTAIN AND INK FOUNTAIN SUPPORT FOR PRINTING PRESS

Edward L. Jurinak, Prospect Heights, Ill., assignor to Apollo Labeling Systems, Worth, Ill.

Filed May 30, 1985, Ser. No. 739,552
Int. Cl.[4] B41F *31/04, 31/06*
U.S. Cl. 101—350 **19 Claims**



1. In a printing press having a frame and a substantially cylindrical form roll having a first end and a second end and a radially outward facing ink-carrying surface extending between said ends mounted for rotation on said frame, said press having an ink fountain having a front portion having a doctor blade for contacting said ink-carrying surface and a rear portion spaced from said front portion, an improved ink fountain support structure comprising, in combination:

first support means for removably engaging said front portion of said ink fountain for enabling said doctor blade to be moved toward and away from said ink carrying surface and to be moved horizontally with respect to said ink carrying surface, including a pair of pivot brackets affixed to said frame and said front portion being slidably movable into and out of engagement with said pivot brackets and mounted for pivotal movement with respect to said brackets; and

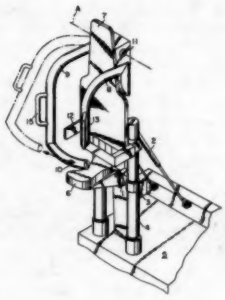
second support means for adjustably and rigidly supporting said rear portion of said ink fountain with respect to said first support means, for maintaining said doctor blade in a desired position with respect to said ink carrying surface and for selectively changing the position of said doctor blade with respect to the ink carrying surface.

4,700,632

DEVICE TO RETAIN ROLLER COASTER PASSENGERS IN STANDING POSITION

Bernard P. Schmutz, Vaud, Switzerland, assignor to Giovanola Freres SA, Monthey and Intamin AG, Freienbach, both of, Switzerland

Filed Sep. 16, 1986, Ser. No. 907,978
Claims priority, application Switzerland, Sep. 17, 1985, 4014/85
Int. Cl.[4] A63G *21/04*
U.S. Cl. 104—63 **4 Claims**



1. A device for retaining passengers on a roller coaster train having a chassis, which enables a passenger to ride in a standing position regardless of their orientation in space and the acceleration to which the passenger is subjected, characterized in that it is comprised of a sliding carriage which is vertically displaceable and lockable on columns, each having a base, which columns are affixed at their base to the chassis of the train, said carriage supporting at least one seat and further comprising a back member on said carriage, a fixed harness disposed on one lateral side of the back member, and a movable harness which has a ventral bar and is disposed on the other lateral side of the back member.

4,700,633

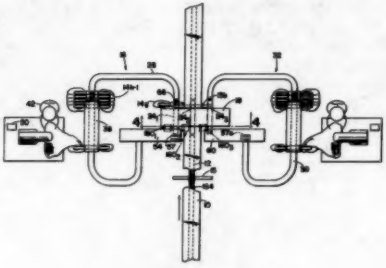
TRACKING APPARATUS IN CONVEYORIZED TRANSPORT SYSTEM

Jacob Weiselfish, West Hartford, and George Collins, Somers, both of Conn., assignors to Gerber Garment Technology, Tolland, Conn.

Filed Jan. 21, 1986, Ser. No. 821,164
Int. Cl.[4] B61B *3/00*; E01B *25/26*
U.S. Cl. 104—102 **11 Claims**

1. In a conveyorized transport system for transporting workpieces to a plurality of work stations which system includes a main rail; a plurality of workpiece carriers movable along said

main rail, each of said carriers having an associated machine readable code; a first subsidiary loop having an entry end and a discharge end, said entry end of said first subsidiary loop being located downstream of said discharge end of said first subsidiary loop with respect to the general direction of travel of said carriers along said main rail; and a transfer rail section used for switching a first one of said carriers from said main rail to said entry end of said first subsidiary loop and switching said



first carrier from said discharge end of said first subsidiary loop to said main rail, said main rail and said subsidiary loop each having a gap for receiving said transfer rail section; and means for moving said transfer rail section from a first position bridging said gap in said main rail to a second position bridging said gap in said subsidiary loop; the improvement comprising:

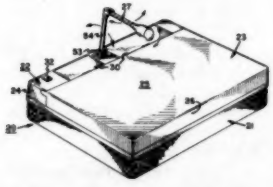
sensing means for reading the code on said first carrier while said first carrier is located on said transfer rail section.

4,700,634

LAP-ORIENTED PORTABLE DESK UNITS

Arthur Mills, 35 Cedar Hill, Weston, Conn. 06883, and Kenneth B. Curtis, 108-25 Seventy Second Ave., Forest Hills, N.Y. 11375

Filed May 16, 1986, Ser. No. 864,033
Int. Cl.[4] A47B *23/00*
U.S. Cl. 108—43 **18 Claims**



1. A portable desk unit constructed for providing an easily employable working surface for use wherever required, said unit comprising:

A. a cushion member

a. comprising a size and shape for being supportingly positioned in the lap of the user.

b. forming substantially the entire lower portion of said portable desk unit, and

c. providing a comfortable support for positioning said desk unit in the user's lap or other desired location; and

B. housing means securely affixed to said cushion member and incorporating

a. a working surface supportingly retained therewith and providing an easily employable, readily accessible surface on which desired activity may be performed,

b. movably adjustable, portable illumination means pivotally mounted to said working surface for movement between a first, folded, stowed position and a second, unfolded deployed position wherein said illumination means is in juxtaposed, spaced, overlying cooperating, movably articulatable relationship with said work surface for providing illumination to any desired location or area thereof and

c. a first compartment formed in said housing means in cooperating relationship with the illumination means for stowably receiving the folded illumination means when said illumination means is in its first position;

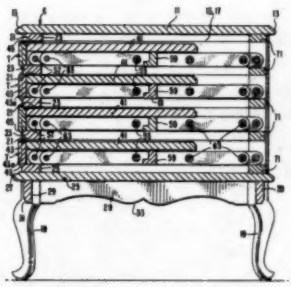
whereby a completely portable, self-contained desk unit is realized, that is capable of providing its own, direct illumination of the work surface.

4,700,635

CONSOLE-HOUSED TRAY TABLE SET

Leonard Eisen, Greenwich, Conn., assignor to Allen Classics, Ltd., North Caldwell, N.J.

Filed Mar. 4, 1986, Ser. No. 836,113
Int. Cl.[4] A47B *7/02*
U.S. Cl. 108—91 **8 Claims**



1. A console-housed tray table set comprising a console cabinet having a solid top wall, solid opposite side walls and front wall defining an interior, said front wall having at least one slot-like opening in the cabinet interior extending horizontially between said side walls; and for such opening a tray table removably stored within the cabinet interior via said horizontal slot-like opening, each such tray table having a solid top panel of a thickness substantially less than the height of said slot-like opening and a width less than the width thereof for reception within said opening, a front panel coneected to the front end of said top panel and projecting below the same at right angles thereto with an area at least generally coextensive with the corresponding slot-like opening so as to closed the same when the tray table is stored within said cabinet, a front pair of legs pivotally connected to said top panel along an axis extending in adjacent parallel relation to said front panel inwardly thereof and a back pair of legs pivoted to said front pair on an axis parallel to said front panel located intermediate the respective lengths thereof for relation scissor-like movement between an expaned generally x-raped erected position and a collapsed, flat position where one leg pair nestles within the other directly beneath and generally parallel to said top panel, said leg pairs in said collapsed position having a thickness not greater than the projection of said front panel below said top panel whereby said top panel and leg pair in said collasped position slidably fit within said slot-like opening projecting into the interior cabinet space, and including detent means depending from the undersurface of said top panel in horizontally spaced relation to said front panel to engage the upper end of the back leg pair when in said erected position and retain the erected leg pairs in downwardly extending tray supporting relation to said front panel to engage the upper end of the back leg pair when in said erected position and retain the erected leg pairs in downwardly extending tray supporting

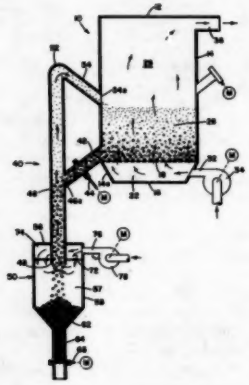
relation, said leg pasirs in collapsed condition having a length parallel to the plane to the top panel which substantially exceeds the corresponding distension of said top panel and the horizontal dimension of said cabinet interior is at least as great as the collapsed length of said leg pairs, one said pair of legs being shorter in length than the other said pair of legs and nestling with the longer leg pair when said leg parts are in collapsed position, said pivot axis pivotally connecting said leg pairs being located on the respective leg pairs at different distance from their corresponding ends, and the pivot axis being displaced along the lengths thereof from the midpoints of the respective leg pairs such that when said leg pairs are retained in said erected postion in downwardly extending tray-supporting relation, the leg pairs are asymmetrically disposed relative to vertical plane through their pivot axis while the lower ends of said leg pairs together define a plane parallel with said top panel, with the distance between the respective lower ends exceeding the distance between their upper ends, and said longer leg pair includes a transverse brace extending between the lower ends of the legs thereof and the lower ends of said shorter leg pair when in said nestled relation terminate inwardly clear of said brace whereby said leg pairs can collapse to said flat position without interference.

4,700,636

ASH CLASSIFIER

Frederich H. Vogt, Westport; Stanley A. Bunk, Greenwich, and John P. D'Acierno, Ridgefield, all of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Oct. 23, 1986, Ser. No. 922,365
Int. Cl.[4] F23J 1/00
U.S. Cl. 110—165 A **5 Claims**



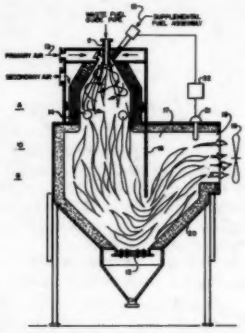
1. An ash classifier for a fluidized bed reactor comprising a first downwardly inclined conduit for receiving a stream of bed material from said reactor under gravity flow conditions, a second substantially vertical classifier conduit connected to said first conduit to receive the the bed material, an ash vessel having a top wall and a bottom wall, said second conduit extending through the said top wall and into said ash vessel, said second conduit terminating below said top wall and well above said bottom wall of said ash vessel, a perforated substantially horizontal air distributor plate located between said top wall of said vessel and the end of said second conduit within said ash vessel, the distributor plate being in surrounding relation to said vertical conduit and extending into contact with said side wall, the region between said top wall and said air distributor plate constituting a windbox, said second conduit extending vertically upward of the connection with said first conduit to a point above the level of bed material in said fluidized bed reactor, said second conduit having a bend at its highest point whereby said second conduit inclines downwardly from said highest point to connect with a port in the fluidized bed reactor for admitting a return flow of fines and air to the combustion compartment of the fluidized bed reactor.

4,700,637

VOLUME REDUCTION OF LOW-LEVEL RADIATION WASTE BY INCINERATION

Michael S. McCartney, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 27, 1981, Ser. No. 325,414
Int. Cl.[4] F23G 7/00
U.S. Cl. 110—237 **2 Claims**



1. An incinerator in which the volume of low-level radiation waste is reduced by combustion, including,

a burner housing opening downwardly,

a first conduit into the burner housing through which low-level radiation waste is flowed to the interior of the housing,

a second conduit into the housing through which supplemental conventional fuel is flowed to the interior of the housing,

a third conduit into the housing through which primary combustion air is flowed to the interior of the housing at a substantially stoichiometric rate,

means within the housing for directing the primary combustion air into a cyclonic swirl which mixes the air and waste and fuel as they are ignited,

a furnace cavity mounted below the burner housing with its top entry aligned with the burner housing exit to receive the combusting mixture of waste and fuel and air,

a fourth conduit connected to the burner housing to introduce secondary combustion air into the mixture in quantities providing a total air in excess of stoichiometric combustion,

a vertical downward flow path extended within the furnace cavity from the connection with the burner housing in which the waste is burned in suspension,

a refractory lining for the burner housing and furnace cavity,

an induction fan mounted at the exit of the furnace cavity to maintain the burner housing and furnace cavity under negative pressure,

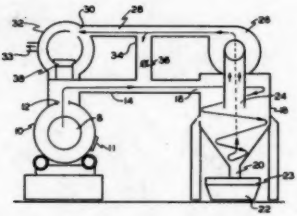
means for sensing the temperature of the products of combustion which exit the furnace cavity,

and means for connecting the temperature sensing means to the supplemental conventional fuel conduit to regulate the rate of fuel flow under the control of the exit temperature.

4,700,638
METHOD AND APPARATUS FOR SOIL DETOXIFICATION

Zygmunt J. Przewalski, Granby, Conn., assignor to M & S Engineering and Manufacturing Co., Inc., Broad Brook, Conn.

Filed Aug. 11, 1986, Ser. No. 895,138
Int. Cl.[4] F23G 7/00
U.S. Cl. 110—346 **7 Claims**



1. A method of detoxifying soil particles containing low melting point mineral compounds contaminated with combustible toxic materials comprising the steps of:

(a) heating said soil particles, without melting said low melting point mineral compounds, to form combusted solids and a mixture of mineral dust and toxic material-containing gases;

(b) separating said combusted solids from said dust-gas mixture;

(c) conveying said dust-gas mixture in a gas flow to a location for separation and thereafter separating said mineral dust from said toxic-material containing gas; and

(d) conveying a portion of the toxic-material containing gas to a combustion location while returning the remainder of said toxic-material containing gas to the gas flow containing the dust-gas mixture and thereafter combusting said toxic material-containing gas to form less harmful combustion products.

4,700,639
UTILIZATION OF LOW GRADE FUELS

Gerald Esterson, 20 Caspi Street; Moshe Pismen, Ramot 23/9, and Zeev Aizenshtat, 6 Haaluf Simhony Street, all of Jerusalem, Israel

Continuation-in-part of Ser. No. 619,937, Jun. 12, 1984, abandoned. This application Dec. 4, 1985, Ser. No. 804,431
Claims priority, application Israel, Mar. 16, 1983, 68149
Int. Cl.[4] F23D 1/00
U.S. Cl. 110—347 **4 Claims**

1. A process for the combustion of solid fuels of low content of organic matter, of high sulfur and carbonate content, containing pyrolyzable constituents, which comprises the steps of:

establishing a first treatment zone;

introducing into the first treatment zone a comminuted solid fuel with a particle size of less than about 15 mm and containing from about 2% to about 20% by weight of fines and containing from about 7% to about 20% by weight of organic matter, containing a high sulfur content, and containing from about 40% to about 70% by weight carbonates;

introducing into the bottom of the first treatment zone a gaseous medium preheated to from about 50° C. to about 600° C. to fluidize the comminuted solid fuel and to create a first fluidized bed;

establishing a second treatment zone;

pyrolyzing and gasifying organic matter in the first fluidized bed within the temperature range of from about 350° C. to about 700° C. while minimizing carbonate decomposition;

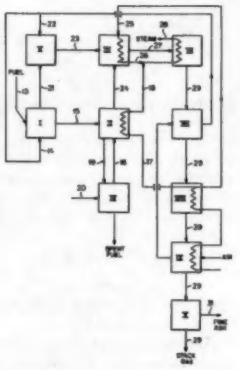
transferring solid residue of coked particles from the first fluidized bed in the first treatment zone to the second treatment zone;

introducing preheated air into said second treatment zone in an amount from about 50% to about 300% of that necessary for coke oxidation to fluidize the particles in said second treatment zone to create a second fluidized bed;

burning residual carbonaceous matter in the solid residue transferred from the first treatment zone into said second treatment zone and in the second fluidized bed within the temperature range of from about 500° C. to about 700° C.;

overflowing spent fuel particles from the second fluidized bed to exhaust same from said second treatment zone;

said first and second fluidized beds being in communication below the surface of the beds to effect the aforementioned transfer whereby as additional comminuted solid fuel is



introduced into the first treatment zone, solid residue from the first fluidized bed will be transferred to the second fluidized bed;

establishing a third treatment zone above and contiguous to both said first and second treatment zones;

transferring combustion gases, tar, and non-combustible gases from the first treatment zone to the third treatment zone;

transferring combustion gases from the second treatment zone to the third treatment zone;

mixing the combustible gases, tar and non-combustible gases from the first treatment zone with the combustion gases from the second treatment zone and directly combusting the mixture in said third treatment zone at a temperature in the range of from about 800° C. to about 1800° C.

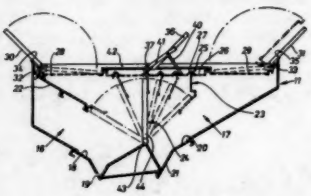
4,700,640
DEVICE IN A COMBINED DRILL FOR SIMULTANEOUSLY SPREADING SEED AND FERTILIZER

Stig G. Andersson, Skurup, Sweden, assignor to Aktiebolaget Overums Bruk, Sweden

Continuation of Ser. No. 698,425, Feb. 5, 1985, abandoned. This application Oct. 3, 1986, Ser. No. 915,916
Claims priority, application Sweden, Feb. 7, 1984, 8400608
Int. Cl.[4] A01C 5/00
U.S. Cl. 111—1 **6 Claims**

1. A combined drill for spreading seed and fertilizer simultaneously comprising a container provided with a top, a partition wall for dividing said container into front and rear compartments for seed and fertilizer, respectively, means on the bottom of said container for pivotally mounting said partition wall, a plurality of drill colters and spreaders, a channel connecting each compartment to the respective drill colter and spreader, an inlet opening in said top for each compartment, said top

being provided with a first guide plate, means pivotally mounting said first guide plate at the front of said top of said container and at the front of and over one inlet opening, a second guide plate, means pivotally mounting said second guide plate at the rear of said top of said container and over another of said inlet openings, a third guide plate having means for pivotally mounting the same between said first and second guide plates, said third guide plate being provided with means for arranging



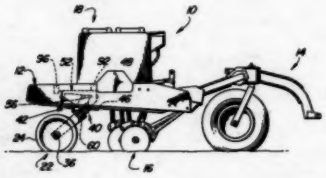
the same to selectively enlarge both inlet openings of said two compartments, the pivot axis of said third guide plate being adjustable to locate above the upper edge of said partition wall whereby said third guide plate is a continuation of one of the sides of said partition wall and functions as a guide to direct the material in one of the compartments, and means on said partition wall for adjusting the length of the same to change the volume of each compartment.

4,700,641

PIVOTING SPRING-CUSHIONED PRESS WHEEL GANG ASSEMBLY

Glenn D. Head, Jr., Des Moines, and Jeffrey J. Postal, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 7, 1986, Ser. No. 828,002
Int. Cl.[4] A01C *5/00;* **A01B** *49/00*
U.S. Cl. 111—85 **16 Claims**



1. In a framed seeding implement adapted for forward movement over the ground and having means for forming a plurality of seed-receiving furrows and depositing seed therein, press wheel structure for firming soil around the deposited seed comprising:

a gang of transversely spaced press wheels;

means for supporting the press wheel gang from the frame in trailing relationship to the furrow-forming means, said means for supporting including first means for permitting the press wheel gang to pivot vertically with respect to the frame about a generally horizontal and transverse axis and second means for permitting the press wheel gang to rock about a generally fore-and-aft extending axis so that the press wheels can move vertically with respect to each other over obstacles;

means for yieldingly biasing the press wheel gang about the transverse axis into soil-firming relationship with the ground; and

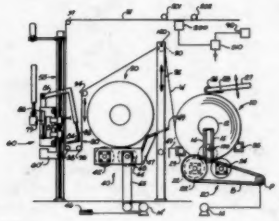
wherein said first means comprises a bracket pivotally connected to the implement frame for rocking about the transverse axis, said second means including fore-and-aft extending pivot structure connecting the press wheel gang to the bracket for permitting the gang to rock freely about the fore-and-aft axis with respect to the bracket, said fore-and-aft extending pivot structure located closely adjacent the transverse axis and wherein a transverse vertical plane containing said transverse axis passes through the pivot structure.

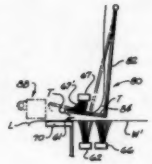
4,700,642

JOINING CONTINUOUS LENGTHS OF WEB MATERIALS

Julian E. Hankinson, Jr., Spartanburg, S.C., assignor to Young Engineering Inc., Spartanburg, S.C.

Filed Apr. 24, 1985, Ser. No. 726,769
Int. Cl.[4] D05B *3/00;* **B65H** *19/16*
U.S. Cl. 112—121.14 **10 Claims**





1. Apparatus for joining leading and trailing web edges of two separate webs to form a continuous web length, said apparatus comprising:

(a) means for moving a first web along a predetermined path of travel;

(b) holding means for locating and holding a leading edge of a second web adjacent said path of travel;

(c) means for locating a trailing edge of said first web adjacent said holding means for said leading edge of said second web;

(d) alignment means for automatically aligning longitudinal edges of said second web with longitudinal edges of said first web, said alignment means including means for sensing the position of said first web longitudinal edges, and for transversely positioning said holding means so that said longitudinal alignment results;

(e) means for inserting said trailing edge of said first web within said web holding means, juxtaposed to said leading edge of said second web and with commonly aligned longitudinal edges; and

(f) means for joining said leading and trailing edges.

9. Apparatus for joining a plurality of webs comprising:

(a) first brush means, said brush means having bristles extending in a direction to engage a surface of a first web, and being controllably movable transverse to such direction and in the plane of said first web surface for selectively transversely locating such surface;

(b) second brush means located adjacent said first brush means, said second brush means being moveable toward

and away from said first brush means and having bristles extending in a direction to engage an opposite surface of said first web;

(c) means to insert a portion of a second web between said brush means when said brush means are immediately adjacent;

(d) sensor means for sensing the presence of longitudinal edges of said second web so that transverse movement of said first bursh means may be controlled for aligning longitudinal edges of said first and second webs; and

(e) sewing means located adjacent said brush means and moveable therealong to seam together webs held thereby.

4,700,643

ROTARY HOOK

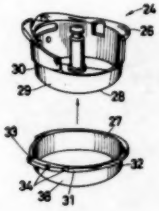
Tokuzo Hirose, and Hiromitsu Shimizu, both of Osaka, Japan, assignors to Hirose Manufacturing Company, Ltd., Osaka, Japan

Filed Jun. 12, 1985, Ser. No. 743,960

Claims priority, application Japan, Feb. 21, 1985, 60-33346; Feb. 21, 1985, 60-23674[U]

Int. Cl.[4] D05B *57/26*

U.S. Cl. 112—231 **11 Claims**



1. In a fully rotating hook being of the type comprising an inner bobbin case extending in an axial direction, an outer loop taker mounted about said bobbin case, said loop taker having a track groove formed therein, means for rotating said loop taker such that relative rotation occurs between said loop taker and said bobbin case, and stopper means for preventing rotation of said bobbin case with said loop taker while said loop taker is rotating, the improvement wherein said bobbin case comprises:

a case body having a fitting portion extending in said axial direction and accommodated in said loop taker; and

a track projection member made of synthetic resin material having a substantially low coefficient of friction and removably fixed to said fitting portion of said case body, said track projection member comprising a flange-like track projection fitting within said track groove of said loop taker and a surrounding portion extending in said axial direction for fixing said track projection member to said fitting portion of said case body, said fitting portion of said case body being smaller than the remainder of said case body to form a stepped portion therebetween and said track projection member being fitted to said case body with said track projection fitted against said stepped portion.

4,700,644

SEWING MACHINE HAVING AN AUTOMATIC LOWER THREAD TENSION DEVICE

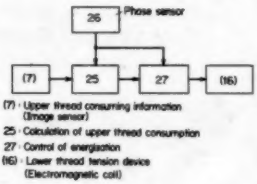
Yasukata Eguchi; Susumu Hanyu, both of Tokyo; Kazumasa Hara, Hino, and Mikio Koike, Oume, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed May 20, 1986, Ser. No. 865,549

Claims priority, application Japan, May 21, 1985, 60-107008

Int. Cl.[4] D05B *63/00, 47/04*

U.S. Cl. 112—255 **7 Claims**



1. A sewing machine device having lower thread tension control comprising:

means for concatenating an upper and lower thread in a fabric to be stitched so as to form a concatenation point where the upper and lower threads cross each other in the fabric and including a needle with an needle eye and which is reciprocably movable to penetrate the fabric to be stitched, a take-up lever which is reciprocably movable to tension the upper thread when moving in one direction and to slacken the upper thread when moving a direction opposite said one direction and which is movable to dead-points when changing said directions, a loop taker with a hook and which is rotatably movable and formed to releasably catch the upper thread with said hook during rotation thereof, means for drawing out the lower thread and including a bobbin freely rotatable in said loop taker and being formed to releasably hold a supply of the lower thread so that the lower thread can be drawn out of the bobbin when the lower thread is tensioned, and an upper shaft operatively connected with said needle, said take-up lever and said loop taker for timingly driving the same, said upper shaft being rotatable through a plurality of angular positions constituting regions of said angular positions between a plurality of phases, the fabric having a center constituting a desired location for the concatenation point, said needle eye being formed for receiving the upper thread therethrough and having an upper end contacting said upper thread when said needle moves toward the fabric, said concatenating means being movable through a plurality of said phases including at least four of said phases (***θ1, θ2, θ3, θ4***) to form each stitch in the fabric to be stitched, said four phases constituting a first (***θ1***), a second (***θ2***), a third (***θ3***) and a fourth (***θ4***) phase, said first phase (***θ1***) arising when said needle moves toward the fabric to be stitched for penetrating the fabric and simultaneously draws out the upper thread and said take-up lever is stopped at a dead point after having moved in said one direction, said second phase (***θ2***) arising when said upper end of said needle eye is at said desired location of said center of said fabric to be stitched and said needle moves in said opposite direction to thereby slacken the upper thread, said third phase (***θ3***) arising immediately after the upper thread is released by said hook of said loop taker, said loop taker being formed to catch the upper thread to concatenate with the lower thread after the upper end of needle eye passes through the fabric to be stitched, said fourth phase (***θ4***) arising when said take-up lever moves in said one direction and has brought the concatenation point to said desired location in the fabric to be stitched; and

means for tensioning the lower thread to provide resistance to a drawing out of the lower thread between said first and said third phases and said fourth and said first phases, but

not between said third and said fourth phases, said take-up lever being formed to bring the concatenation point to the center of the fabric to be stitched for said fourth phase and to draw out a predetermined amount of upper thread (l) to tighten the stitch between said fourth and said first phases.

4,700,645

SEWING MACHINE HOUSING CONSTRUCTION

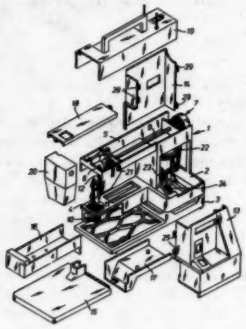
Joseph Kefer, Bruchsal, and Gerhard Ruf, Karlsruhe, both of Fed. Rep. of Germany, assignors to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 15, 1986, Ser. No. 907,742

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3533205

Int. Cl.[4] D05B *73/00*

U.S. Cl. 112—259 **5 Claims**



1. A sewing machine, comprising a base for holding a machine drive mechanism, a housing base covering extending over said base, a plurality of individual covering pieces attachably joinable to said housing base covering and to each other by an edge connection, at least some of said plurality of individual covering pieces being of different shapes and having substantially the same edge contours and edge designs so that they are interchangeable with one another at a specific location on said housing base covering whereby the shape of the sewing machine can be changed.

4,700,646

SEWING MACHINE WITH RETRACTABLE HANDWHEEL

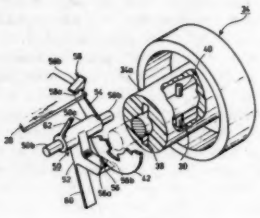
Osamu Kamiya, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 23, 1986, Ser. No. 910,596

Claims priority, application Japan, Oct. 28, 1985, 60-240882

Int. Cl.[4] D05B *69/34*

U.S. Cl. 112—279 **20 Claims**



1. A sewing machine having a frame, a main shaft rotatably mounted upon said frame, stitch forming instrumentalities, including a sewing needle, operatively connected to said main shaft, and a handwheel mounted upon and rotatable with said main shaft, said sewing machine comprising:

said handwheel having a closed outer end surface for enclosing the end of said main shaft upon which said handwheel is mounted;

recess means formed within a sidewall of said frame;

means supporting said handwheel for axial slideable movement upon said main shaft between a first retracted position, at which said handwheel is stored within said recess means of said frame such that said closed outer end surface of said handwheel is substantially flush with said sidewall of said frame, and a second extended position at which only said handwheel projects outwardly from said recess means of said frame and beyond said sidewall of said frame so as to thereby permit manual operation of said handwheel by an operator; and

means for releasably holding said handwheel at least at one of said first and second retracted and extended positions.

4,700,647

BOOM OF THE WISHBONE-TYPE FOR SAILING BOARDS

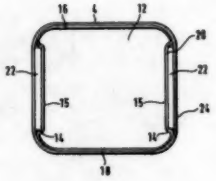
Arno R. E. K. Pabsch, Brunswick, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Fed. Rep. of Germany

Filed Mar. 14, 1986, Ser. No. 841,792

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1985, 3510294

Int. Cl.[4] B63H *9/10*

U.S. Cl. 114—39 **13 Claims**



1. In a wishbone-type boom for a sail board comprising a pair of elongated, arcuately outwardly bowed spars joined at opposite ends thereof with end pieces and adapted for receiving a sail therebetween, the improvement comprising each of said spars comprising an elongated substantially rigid foam core having elongated, substantially flat, longitudinally extending inner and outer sides which face inwardly toward said sail and outwardly away from said sail, respectively, when the latter is received between said spars, a first reinforcing layer of resin-bonded, synthetic fibrous material over said core, the fibers of said first reinforcing layer crossing each other at angles of between 30° and 60° with respect to the longitudinal extent of said core, a pair of elongated, longitudinally extending inner and outer stiffening members on said reinforcing layer, said inner and outer stiffening members being formed from substantially unidirectional, longitudinally disposed, resin-bonded carbon fibers and having substantially flat longitudinally extending surfaces thereon which face the inner and outer surfaces of said core, respectively, and a second reinforcing layer of resin-bonded, synthetic fibrous material over said first reinforcing layer and said stiffening members, the fibers of said second reinforcing layer crossing each other at angles of between 30° and 60° with respect to the longitudinal extent of said core.

4,700,648

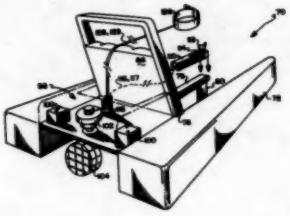
PROPELLED PONTOON CHAIR

George M. Trefethern, and Marian J. Trefethern, both of P.O. Box 947, Myrtle Beach, S.C. 29578-0947

Continuation of Ser. No. 667,264, Nov. 1, 1984, abandoned, which is a continuation-in-part of Ser. No. 472,142, Mar. 4, 1983, Pat. No. 4,480,568, which is a continuation of Ser. No. 240,777, Mar. 5, 1981, abandoned. This application Jul. 8, 1986, Ser. No. 882,460

Int. Cl.[4] B63B *1/12;* B63H *25/00*

U.S. Cl. 114—61 15 Claims



1. A water vehicle, comprising:

a pair of spaced apart pontoons;

a support means maintained between said pontoons;

a chair adjustably positioned upon said support means;

propulsion means for moving the vehicle through the water, said propulsion means positioned behind said chair; and

operator control means for regulating both speed and direction of the vehicle, said control means including a pair of cables, a first cable connected to said propulsion means for controlling direction, a second cable connected to a regulator for controlling speed, and a headband having a bracket attached thereto, said first cable being connected directly to said headband and said second cable being slidably received upon said bracket.

6. A water vehicle, comprising:

a pair of spaced apart pontoons;

a support member maintained between said pontoons;

a chair vertically adjustably positioned upon said support member;

means for varying ballast maintained directly beneath said chair and comprising a compartment selectively sealed by a plug, said ballast varying as a function of an amount of liquid within said compartment, said liquid entering and exiting via said plug; and

wherein the space between said pontoons in front of said chair is open, allowing the legs of a user within said chair to extend downwardly between and beyond said pontoons for entry into the water.

4,700,649

APPARATUS FOR CHANGING THE MAST OF A SAILBOARD

Udo Schötz, Rückersteg 4, D-5418 Selters, Fed. Rep. of Germany

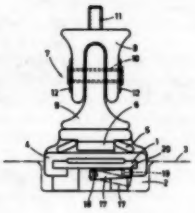
Continuation of Ser. No. 741,293, Jun. 4, 1985, abandoned. This application Nov. 26, 1986, Ser. No. 935,640

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1984, 3421883

Int. Cl.[4] B63B *15/00*

U.S. Cl. 114—90 1 Claim

1. Device for adjusting the mast of a sailboard, with a slide accommodating the mast foot by way of a rubber joint, this slide being guided so that it can be adjusted and locked in position on a profiled rail countersunk in the sailboard in the longitudinal extension of the latter, characterized in that the rubber joint (7) between the mast and the slide (4) consists of an upper rubber section (8) and a lower rubber section (9), which rubber sections are pivotably connected with each other about a hinge pin (10) arranged perpendicularly to the mast and passing through the rubber joint, the hinge pin (10) being



hollow and being flanged back on its ends onto shims (12) which are disposed against the rubber joint.

4,700,650

BOAT WITH APPARATUS FOR RETURNING TO UPRIGHT CONDITION

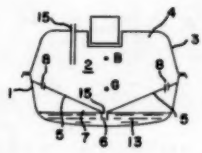
Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jul. 29, 1985, Ser. No. 760,287

Claims priority, application Japan, Jul. 31, 1984, 59-161329

Int. Cl.[4] B63B *39/03*

U.S. Cl. 114—125 4 Claims



1. A water craft comprising a substantially enclosed room, partition means provided in said room adjacent the bottom of said craft to form in said room an upper compartment and a lower compartment under said upper compartment, said lower compartment being adapted to contain water, and said partition means being adapted to substantially prevent said water from entering said upper compartment when said craft is overturned, said partition means comprising a pair of partitions, each slanting from one lateral side of said craft downwardly to substantially the center of said craft, said partitions being interconnected and forming a longitudinal valley therebetween, and said valley having a bilge hole formed therein through which said compartments communicate with each other.

4,700,651

FAIRING FOR TOW-CABLES

Neville E. Hale, Mississauga, Canada, assignor to Fathom Oceanology Limited, Mississauga, Canada

PCT No. PCT/US84/00037, § 371 Date Sep. 26, 1984, § 102(e) Date Sep. 26, 1984, PCT Pub. No. WO84/02890, PCT Pub. Date Aug. 2, 1984

PCT Filed Jan. 13, 1984, Ser. No. 684,840

Claims priority, application Canada, Jan. 18, 1983, 419704

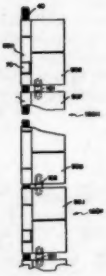
Int. Cl.[4] B63B *21/00*

U.S. Cl. 114—243 7 Claims

1. Fairing for a tow-cable, the fairing having a tail portion which is constructed and arranged to adopt a trailing orientation with respect to the cable;

wherein the tail portion is divided into segments which are short enough, measured axially along the length of the

cable, to permit the fairing to distort sufficiently that the cable and the fairing can be wound together on a winch;
wherein the fairing includes a nose portion which encircles the cable, to the extent of constraining the fairing from becoming detached from the cable;
the fairing being characterised by the following combination of features:
said nose portion has a large clearance on the cable, such that when the fairing is in the trailing orientation, and the leading edge of the cable is as far forward with respect to the encircling portion as it can be, the fairing can, in that condition, rock or roll frictionlessly from side to side with respect to the cable at least through an angle of two degrees, without sliding or rubbing against the cable;
said nose portion is slit so that it may be prised open to allow it to be assembled radially onto the cable;
the nose and tail portions are separate pieces adapted to be assembled together after the nose piece is on the cable;
the nose and tail portions are both divided into respective segments, such that adjacent segments of the nose portion



are separate pieces, and adjacent segments of the tail portion are separate pieces;
segments of the tail portion are staggered with respect to segments of the nose portion, in that a segment of the tail portion is connected to more than one segment of the nose portion, and in that a segment of the nose portion is connected to more than one segment of the tail portion; and
means is provided which keeps the segments of the tail portion from becoming locked, by friction, in misalignment with each other; which means comprises:
a means for locating the tail segments each to adjacent tail segments such that substantially no relative movement between the tail segments can occur in a direction at right angles to the cable axis; and
a means for suspending segments in sections, each section being suspended in tension underneath a respective abutment on the cable, such that there are substantially no contact forces between adjacent tail segments, nor between the tail segments and other parts of the fairing or cable.

4,700,652

MARINE ANCHOR

Robert E. Pekny, 355 53rd St. N., St. Petersburg, Fla. 33710

Filed Jun. 9, 1986, Ser. No. 872,550
Int. Cl.[4] B63B *21/24*
U.S. Cl. 114—303 **1 Claim**

1. A marine anchor assembled of its component parts comprising:
a. an anchor body consisting of a vertical central shaft surrounded by two opposing arms,
b. a shank which is inserted into said vertical shaft in said anchor body, said shank having at its upper end an opening through which is attached a means of connecting said anchor to its cable or chain,
c. an anchor stock which is inserted through aligned openings, these openings being both at the base of said shank and the base of said shaft, and being at right angles to said opposing arms, and
d. said anchor stock being held fixably in place at its approximate center to said anchor body with conveniently removable latching means, and

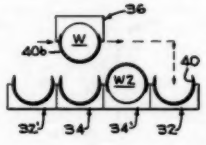
e. said anchor stock fixably locking said anchor shank into said shaft in said anchor body, and
f. a pair of flukes demountably attached to the ends of said arms of said anchor body, and
g. said flukes being held to said arms with conveniently removable latching means, whereby an anchor of great strength and holding power is quickly assembled from its compact and easily stowable component parts.

4,700,653

SUBMARINE WEAPON HANDLING SYSTEM

Robert M. Harris, New Hope, and Arthur G. Blomquist, Plymouth, both of Minn., assignors to FMC Corporation, Chicago, Ill.

Filed Mar. 31, 1986, Ser. No. 846,434
Int. Cl.[4] B63G *8/28, 8/30, 8/32*
U.S. Cl. 114—316 **30 Claims**



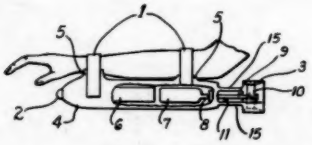
1. A weapon handling system comprising:
means defining a weapon storage unit adapted to receive a weapon;
means defining a ramming unit for receiving a weapon to be launched;
means defining a transfer unit for transferring a selected weapon between a storage unit and said ramming unit;
means defining a plurality of bands in each unit movable between an open position for permitting a weapon to be transferred between associated units and a closed position clamping the weapon to an associated unit, and
means for ramming the weapon when in said ramming unit longitudinally out of said ramming unit.

4,700,654

PROPULSION DEVICE FOR SWIMMERS AND DIVERS

Michael Borges, 3256 S. Main #41A, Santa Ana, Calif. 92707

Filed Jun. 27, 1986, Ser. No. 879,344
Int. Cl.[4] B63B 21/00
U.S. Cl. 114—338 5 Claims



1. An underwater propulsion device for an individual of the type in which a battery-driven motor in a housing operates a propeller, in which the improvement comprises:

A single housing containing the battery and motor lying along the line of maximum thrust of the propeller, said single housing also containing a control switch on the forward end, and

a plurality of strap attachments to attach the housing of the device along the forearm of the user, and

switch means on the forward surface of the housing, located within reach of the user's fingers on the forearm to which the device is attached for switching the motor on and off, and

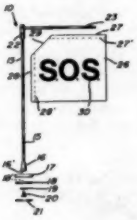
a shroud around the propeller which serves the threefold purpose of protecting the user, preventing fouling of the propeller, and increasing the efficiency of the propeller.

4,700,655

SIGN SUPPORT STRUCTURE

Daniel Kirby, 13 Mohawk Beach Road, Montreal, Quebec, Canada

Filed Aug. 26, 1986, Ser. No. 900,519
Int. Cl.[4] G09F 17/00
U.S. Cl. 116—174 8 Claims



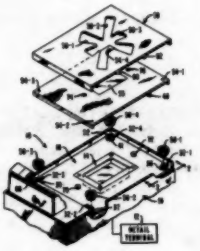
1. A sign support structure comprising an elongated main shaft secured at a lower end to a support base, said support base having a magnet secured therein, a flat support surface under said support base, a coupling element removably secured to an upper end of said main shaft, a transverse support shaft secured to said coupling element, said coupling element having an axial bore opening in a lower end thereof to receive a free end portion of said upper end of said main shaft, said coupling element further having a second bore disposed transverse to a longitudinal axis of said axial bore and located above said axial bore and below said transverse support shaft for receiving said free end portion of said main shaft when said support structure is in a storage position, a removable flag supported by said main and transverse shafts, said second bore being dimensioned to receive said free end portion ofsaid main shaft in friction fit therein, when said support structure is in said storage position, said main shaft and transverse support shaft being disposed substantially parallel and in close relationship to one another with said flag retained by said transverse shaft and said main shaft.

4,700,656

QUICK-CLEANING, SCANNING/WEIGHING APPARATUS

Richard E. Cone, Cambridge, and John F. Paugstat, Salesville, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 22, 1986, Ser. No. 945,052
Int. Cl.[4] G01G 19/00, 3/14; G06K 7/10
U.S. Cl. 177—245 6 Claims



1. A scanning/weighing apparatus comprising:

a support plate having a predetermined number of holes therein;

a scanning unit mounted in said support plate;

a weighing beam assembly for each said hole, with each said weighing beam assembly including a load cell;

means for mounting each said weighing beam assembly on said support plate so that its associated load cell projects upwardly through the associated said hole when said support plate is in a horizontal position;

each said load cell having a projection;

a weighing plate having a hole therein for each of said load cells, each said hole in said weighing plate being complementary in shape to each said projection and also being accurately located in said weighing plate to receive the associated said projection to enable said weighing plate to be supported on said load cells of said weighing beam assemblies;

said weighing plate having a transparent section aligned with said scanning unit; and

a scanning plate positioned over and supported on said weighing plate, with said scanning plate having a scanning opening therein which is aligned with said transparent section and said scanning unit.

4,700,657

FINGERPRINTING SYSTEM INCORPORATING A SPRAY CONTAINER AND A PORTABLE VAPOR TANK

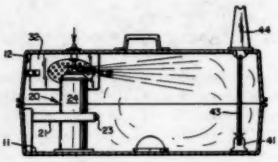
Charles L. Butland, Marina del Rey, Calif., assignor to Print-Lock Corporation, Playa Del Rey, Calif.

Filed Jul. 10, 1985, Ser. No. 754,063
Int. Cl.[4] B41K 1/00
U.S. Cl. 118—31.5 5 Claims

1. A self-contained fingerprinting system comprising:

a portable vapor tank in which is disposed a container in which is disposed a mixture of cyanoacrylate ester and a chlorinated organic solvent, a container holder for holding said spray container, supporting means for supporting an object in front of said spray container, and a push-button disposed outside of said vapor tank so that it is able to trigger said spray container, said spray container having discharging means which can be triggered by said push-

button to discharge a mist of atomized particles of said cyanoacrylate ester in order to generate vapors thereof in



order to fume said object which is suspected of containing latent fingerprints.

4,700,658

DEVICE FOR COATING TRAVELING MATERIAL

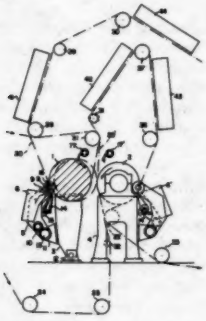
Rudolf Beisswanger, Steinheim; Albert Wohrle, deceased, late of Heidenheim (by Ingrid Wohrle, executor), and Anton Plomer, Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith, GmbH, Heidenheim, Fed. Rep. of Germany

Filed Nov. 4, 1985, Ser. No. 794,506

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1984, 3440634

Int. Cl.[4] B05C *3/132, 5/02*

U.S. Cl. 118—67 **6 Claims**



1. A device for coating and sizing traveling webs comprising:

two press roll oppositely disposed in essentially the same horizontal plane, said press rolls being movable relative to one another to define a sizing press gap therebetween adapted to receive the web therethrough and provide sizing of the web,

at least one sizing feed means disposed above one of said press rolls upstream of said sizing press gap therebetween for feeding sizing between said one roll and the web,

a coater assembly being coordinated with and disposed adjacent to at least one of said press rolls, said coater assembly including a doctor blade and a nozzle type applicator being arranged on the side of said one press roll facing away from the other press roll,

a plurality of first reversing rollers adapted to direct the web into the sizing press gap between the press rolls wherein the last of said first rollers located upstream of the sizing press gap is positioned above the press rolls, and

a plurality of second reverseing rollers adapted to direct the web into the coating assembly wherein the last one of said second rollers upstream of the coating assembly is positioned below the two press rolls.

4,700,659

DEVELOPING UNIT OF DRY TYPE

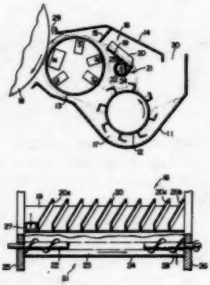
Koji Hirakura, Kanagawa, and Masumi Ikesue, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,872

Claims priority, application Japan, May 20, 1981, 56-076033

Int. Cl.[4] G03G *15/08*

U.S. Cl. 118—652 **11 Claims**



10. A developing unit for delivering developer to a latent image carrier, comprising developer carrying means for carrying developer on its surface for supply to the latent image carrier, means including a doctor member for controlling the quantity of developer on the developer carrying means to a given thickness before a developing process takes place, a flow plate for receiving an excess by the doctor member for allowing the developer to flow therealong, means including at least one deflector member disposed on the flow plate for causing the developer which flows therealong to be directed towards one side, and conveying means including a screw assembly for receiving the developer which has been directed toward said one side and for conveying it towards the other side so as to be returned into a developing vessel, in which the deflector member comprises a number of deflector plates disposed at an angle with respect to the flow plate and in parallel relationship with respect to each other, the lower portion of the flow plate being formed with a single developer inlet opening which communicate with the screw assembly in a region adjacent the side of the deflector member towards which the developer is directed by said deflector plates, the screw assembly being formed with a developer discharge opening in its end opposite from the inlet opening for returning the developer to the vessel.

4,700,660

EVAPORATOR FOR DEPOSITING FILMS IN A VACUUM

Georgy T. Levchenko, and Alexandr N. Radzikovsky, both of Kiev, U.S.S.R., assignors to Kievsky Politekhnichesky Institut, Keiv, U.S.S.R.

PCT No. PCT/US85/00033, § 371 Date Jan. 28, 1986, § 102(e) Date Jan. 28, 1986, PCT Pub. No. WO86/00092, PCT Pub. Date Jan. 3, 1986

PCT Filed Apr. 24, 1985, Ser. No. 829,651

Claims priority, application U.S.S.R., Jun. 12, 1984, 3753279

Int. Cl.[4] C23C *14/24*

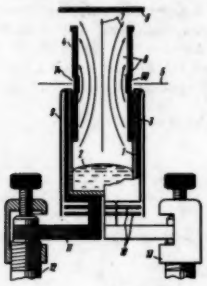
U.S. Cl. 118—726 **11 Claims**

2. An evaporator for depositing a film in a vacuum, comprising:

a crucible for containing an evaporant material adapted to be heated to evaporate the evaporant material to establish a directional vapor flow toward a substrate upon which a film is to be deposited;

and tube means removably mounted in said crucible for forming a directional flow of vapor of evaporant material to be deposited and having mounting means on each end

thereof for selectively removably mounting said tube means in said crucible, said tube means defining a transverse symmetry plane to enable said tube means to be



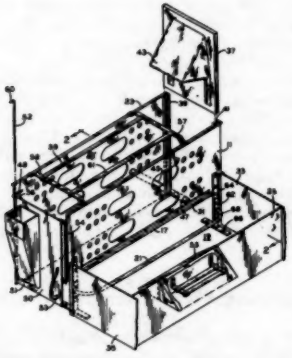
mounted alternately with one of its ends mounted in said crucible and then removed and mounted with its other end in said crucible, the midportion of said tube means defining at least one annular recess.

4,700,661

SWINE FARROWING SYSTEM

John D. Lawson, R.R. 1, Box 83, Leesburg, Ind. 46538

Filed Oct. 18, 1985, Ser. No. 788,794
Int. Cl.[4] A01K *1/02*
U.S. Cl. 119—20 14 Claims



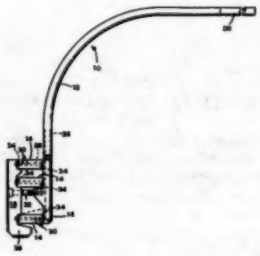
13. In a farrowing crate having a pair of opposed upstanding generally parallel sidewalls and a pair of opposed upstanding generally parallel end walls defining a sow pen, the improvement wherein one of the sidewalls extends substantially to the bottom of the crate and forms a sidewall for an adjacent farrowing crate while the other terminates along a generally horizontal bottom edge elevated above the bottom of the crate creating a nursing gap which allows access to a mother sow by young pigs from a region adjacent the other sidewall.

4,700,662

SLUDGE LANCE WAND

Floyd A. Fasnacht, Jr., Forest; Frank C. Klahn, Huddleston; Bruce W. Schafer, and Charles E. Werner, both of Lynchburg, all of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 13, 1986, Ser. No. 874,257
Int. Cl.[4] F22B *37/52*
U.S. Cl. 122—392 12 Claims



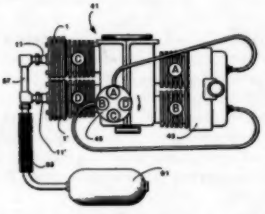
1. A sludge lance wand, comprising:
a. a high pressure fluid feed tube;
b. a first nozzle brace attached to one end of said fluid feed tube and in fluid communication therewith;
c. a second nozzle brace attached to said first nozzle brace; and
d. a plurality of nozzle blocks positioned between said first and second nozzle braces and in fluid communication with said first nozzle brace.

4,700,663

AIR COMPRESSOR

Larry W. Dunn, Rt. 6, Sanders Dr., Anderson, S.C. 29624

Filed Apr. 21, 1986, Ser. No. 839,694
Int. Cl.[4] F04B *41/04*
U.S. Cl. 123—1 R 4 Claims



1. An internal combustion engine modified to produce compressed air, comprising:
an opposing four cylinder air cooled engine;
two of said cylinders of said opposing four cylinder air cooled engine being substantially unmodified so as to be responsive to internal combustion;
the remaining two cylinders of said opposing four cylinder air cooled engine being mechanically interlinked to said two unmodified cylinders and each defining a piston housing,
a cylinder head adapted to mate with each piston housing, said cylinder head comprising a machined block of metal defining cooling fins on the exterior thereof,
an inlet port and an outlet port communicating with the cylinder of said piston housing,
a spring actuated outlet valve in said outlet port,

a spring actuated inlet valve in said inlet port,

means for retaining said inlet valve within said inlet port, and

means for retaining said outlet valve within said outlet port, whereby upon operation of said engine said piston reciprocates within said cylinder to draw air through said inlet valve, compress said air within said cylinder and release compressed air through said outlet valve.

4,700,664

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

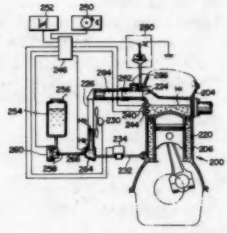
Yoshimasa Hayashi, Kamakura; Yutaka Minezaki, Koshigaya; Yoji Ito, Tokyo, all of Japan; Naoyuki Inoue, Alexandria, Va., and Yoshinori Hirano, Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 21, 1985, Ser. No. 747,248

Claims priority, application Japan, Jul. 6, 1984, 59-140059; Sep. 29, 1984, 59-202944

Int. Cl.[4] F01P *3/22*

U.S. Cl. 123—41.27 **13 Claims**



1. In an internal combustion engine

a structure subject to high heat flux a cooling circuit for removing heat from said structure, said circuit comprising:

a coolant jacket formed about said structure and into which coolant is introduced in liquid form and permitted to boil.

a radiator in which gaseous coolant is condensed to its liquid state, said radiator fluidly communicating with said coolant jacket via a vapor transfer conduit, and

coolant return means for returning liquid coolant from said radiator to said coolant jacket in a manner to maintain said structure immersed in a predetermined depth of liquid coolant; and

means for varying the amount of liquid coolant in said cooling circuit in a manner which controls the pressure prevailing within said cooling circuit.

6. A method of cooling an internal engine comprising the steps of:

introducing liquid coolant into a coolant jacket disposed about structure of the engine subject to high heat flux;

permitting the liquid coolant to boil and produced coolant vapor;

condensing the coolant vapor in a condenser;

modifying the rate at which the coolant vapor is condensed using a device which modifies the heat exchange between the radiator and a cooling medium which surrounds the condensor; and

varying the pressure in said coolant jacket and said condenser by varying the amount of coolant contained in the coolant jacket and the condenser.

4,700,665

CYLINDER HEAD WITH COOLANT PASSAGE PASSING AROUND OUTSIDE OF CYLINDER HEAD FIXING BOLT BOSS AND DIRECTING COOLANT FLOW TOWARD SQUISH AREA COOLING PASSAGE PORTION

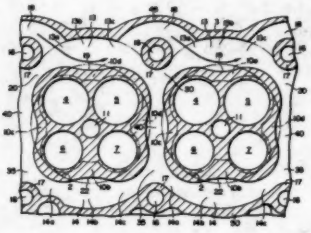
Mutsumi Kanda; Takeshi Okumura, and Yoshihiro Iwashita, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 8, 1986, Ser. No. 883,036

Claims priority, application Japan, Jul. 10, 1985, 60-151615

Int. Cl.[4] F01P *3/02*

U.S. Cl. 123—41.82 R **11 Claims**



1. For an internal combustion engine of an automotive vehicle, comprising a cylinder block formed with a first cylinder bore and a second cylinder bore, and first and second pistons respectively fitted in said first cylinder bore and said second cylinder bore and reciprocating therein:

a cylinder head for affixment to said cylinder block and for defining a first combustion chamber and a second combustion chamber by first and second portions of said cylinder head in cooperation respectively with said first piston and said first cylinder bore, and said second piston and said second cylinder bore, formed with:

(a) a portion which in cooperation with a portion of said first piston defines a squish area of said first combustion chamber;

(b) a cylinder fixing bolt hole boss between said first portion of said cylinder head which defines said first combustion chamber and said second portion of said cylinder head which defines said second combustion chamber and disposed towards the side of said cylinder head on the side of said squish area;

(c) a side wall defining one side of a coolant passage which substantially follows through said cylinder head proximate to said squish area so that a first portion of said coolant passage directly cools said squish area;

(d) a second portion of said coolant passage passing around said cylinder fixing bolt hole boss at least between it and said side wall of said cylinder head;

(e) said second coolant passage portion directing flow of coolant therethrough to said first coolant passage portion.

4,700,666

INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Syouzabu Ura, Fujisawa; Tsutomu Kikuchi, and Makoto Yasuda, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 7, 1986, Ser. No. 848,489

Claims priority, application Japan, Apr. 11, 1985, 60-52745[U]

Int. Cl.[4] F02B *27/02*

U.S. Cl. 123—52 MB **3 Claims**

1. An induction system for an internal combustion engine having first and second groups of cylinders of which firing orders are respectively discontinuous, comprising:

a first collector for supplying air to the first group of cylinders;

a second collector for supplying air to the second group of cylinders, said first and second collectors being elongated in parallel to each other and having open ends and closed ends which are arranged reversely to each other;

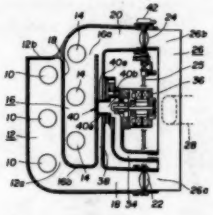
a first main air supply passage fluidly connected to said first collector to form a first air supply line;

a second main air supply passage fluidly connected to said second collector to form a second air supply line independent from said first air supply line, said first and second main air supply passages being elongated in the direction transversing the longitudinal axes of said collectors and having downstream ends in communication with said open ends of said first and second collectors;

a first throttle valve disposed in said first main air supply passage;

a second throttle valve disposed in said second main air supply passage;

an additional air supply passage bypassing said first and second throttle valves for supplying additional air to said



first and second collectors, said additional air supply passage having a bifurcated downstream end fluidly connected to said first and second air supply lines, said bifurcated downstream end constituted by a balance passage having opposed ends fluidly connected to said first and second main air passages, said balance passage being elongated in parallel to said first and second collectors and having a balance tube comprising a tubular main body with an open end and a closed end and an outward flange at the open end, said tubular main body having at the circumferential peripheral wall thereof a pair of diametrically opposed balance holes, said balance tube being disposed in said balance passage at an approximately central portion thereof in such a manner as to communicate at said open end with an upstream end side of said additional air supply passage and at said balance holes with said opposed ends of said balance passage; and

an additional air control valve disposed in said additional air supply passage for controlling air flow therethrough.

4,700,667

INTERNAL COMBUSTION ENGINE

Bernt E. Ohna, Broveien 15, N-1315 Nesoya, Norway

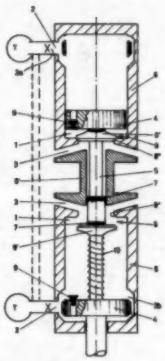
Filed Nov. 26, 1985, Ser. No. 802,215

Claims priority, application Norway, Dec. 5, 1984, 842280

Int. Cl.[4] F02B *75/16*

U.S. Cl. 123—61 R **5 Claims**

1. In a two-stroke internal combustion engine comprising at least two aligned cylinders, each said at least two aligned cylinders having facing proximate ends and remote distal ends, each said cylinder further housing a movable piston having proximate and distal faces, each piston being aligned as a pair rigidly interconnected by a piston rod, the improvement comprising: a carrier fixed to said piston rod, said carrier operating exhaust valve heads opening and closing exhaust valves formed at said proximate end of each said cylinder alternatingly, said proximate end of each said cylinder further comprising a valve seat for engagement with said valve head, each said cylinder further comprising intake ports at said distal end thereof, said intake ports having pressure controlled check valves, said engine having a combustion chamber formed between each said proximate cylinder end and its corresponding proximate piston face; wherein as each said piston ap-



proaches the corresponding distal end of its respective cylinder, said carrier lifts the corresponding valve head from its valve seat.

4,700,668

METHOD OF INJECTING FUEL FOR TWO-STROKE ENGINE AND APPARATUS THEREFOR

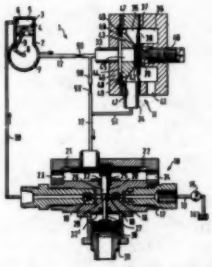
Roland Schierling, Affalterbach; Werner Geyer, Waiblingen; Michael Wissmann, Schorndorf-Weiler, and Hans Nickel, Cottenweiler, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 17, 1986, Ser. No. 875,407

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1985, 3521772

Int. Cl.[4] F02B *33/04*

U.S. Cl. 123—73 C **23 Claims**



1. A method of injecting fuel in a two-stroke engine for a hand-held portable tool, the engine being equipped with a fuel injection pump having a diaphragm and having a piston and cylinder conjointly defining a combustion and a crankcase wherein pressure is developed in response to movement of the pistion, the method comprising the steps of:

conducting said pressure away from said crankcase and charging the fuel-injection pump therewith to pump the fuel in dependence thereon for injecting and burning the same in the engine;

triggering the injection process and initiating the injection of

fuel into the combustion chamber in response to an increase in said pressure; and,

regulating the pressure conducted away from said crankcase which acts directly on said diaphragm in dependence upon at least one of the following: the rotational speed of the engine and the load on the engine.

4,700,669

INTAKE DEVICE OF AN INTERNAL COMBUSTION ENGINE

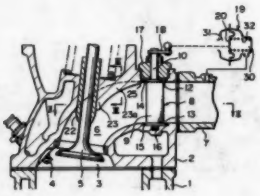
Kazuhiro Sakurai, Gotenba, and Kyo Hattori, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 19, 1985, Ser. No. 810,786

Claims priority, application Japan, Dec. 20, 1984, 59-192107[U]

Int. Cl.⁴ F02F *1/42*; F02B *31/00*

U.S. Cl. 123—188 M **12 Claims**



1. An intake device for an internal combustion engine having an intake port, an intake valve and a valve guide projecting downwardly from the upper wall of the intake port, said device comprising:

a rotary valve mounted for rotation in said intake port and having a substantially vertically extending valve shaft, said valve shaft being offset relative to the longitudinal axis of said intake port, said rotary valve having a valve plate positioned in said intake port;

an actuator connected to said valve shaft for rotating said rotary valve from a closed position to a fully opened position in which said valve plate extends substantially parallel to the axis of said intake port; and

a projecting wall projecting downwardly from the upper wall of said intake port and having an air-flow-guiding portion which extends from said valve guide towards said rotary valve, said air-flow-guiding portion having its width gradually decreasing in a direction toward said rotary valve and terminating in an end which is positioned downstream of said valve plate and which is aligned with said valve plate and adjacent to the downstream end of said valve plate when said rotary valve is in said fully opened position.

4,700,670

OIL FILTER ADAPTER PROVIDING PARALLEL LOOP FLOW PATHS

Harvey R. Schade, 303 High St., P.O. Box 269, Edgerton, Wis. 53534

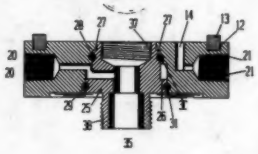
Continuation-in-part of Ser. No. 512,249, Apr. 30, 1984, which is a continuation-in-part of Ser. No. 390,396, Jun. 21, 1982. This application Feb. 10, 1986, Ser. No. 828,032

Int. Cl.⁴ F01M *1/00*

U.S. Cl. 123—196 A **6 Claims**

1. An internal combustion engine oil filtration apparatus for providing parallel flow delivery to multiple filtering media from a single stream of unfiltered circulated oil and return flow in a combined stream of filtered oil from such media to oil galleries of an engine comprising

an annular plate configured with an inner peripheral extremity and outer peripheral extremity wherein said inner peripheral extremity defines a central walled opening for receiving annular bushing means disposed to provide a port for filtered oil flow through said annular plate, said annular plate being further configured with at least one non-centrally disposed opening defining a port for unfiltered oil flow through said annular plate, said annular plate being further configured with a first oil flow passage and a second oil flow passage with each said passage disposed internally of said plate and opening to external environs through said outer peripheral extremity of said plate, which said passages provide branch courses for, respectively, filtered oil flow and unfiltered oil flow, wherein terminal portions of said passages opening through said outer peripheral extremity of said plate are configured to receive fittings for sealably communicating said passages to means for containing a filter medium, and further wherein another terminal portion of said second passage for unfiltered oil flow communicates through an annular face of said annular plate to external environs and further wherein another terminal portion of said first passage for filtered oil flow communicates through said inner peripheral extremity of said annular plate to said central opening,



annular bushing means configured with a lesser diameter externally threaded portion disposed to extend axially outward from a face of said annular plate and further configured with an internally threaded portion of greater diameter for being received in said central opening of said annular plate, and bushing means being further configured with an outer, enlarged diameter shoulder for being operably disposed in seating contact with said annular plate to obstruct passage of direct communicating flow between said annular plate face and central walled opening, said bushing means being further provided with at least one opening disposed in the wall thereof to provide a port for communicating flow from said first passage to said central opening, said externally and internally threaded portions being complementary in size for enabling said internally threaded portion to be received in place of a spin-on filter during installation on an engine and such spin-on filter being then received on said internally threaded portion, said internally threaded portion being of external diameter at least in part to substantially fay with said central walled opening.

4,700,671

INTERNAL COMBUSTION ENGINE PROVIDED WITH FUEL INJECTION DEVICE

Yukio Matsushita, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 28, 1985, Ser. No. 695,270

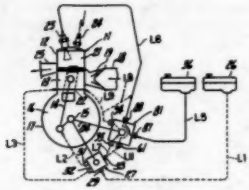
Claims priority, application Japan, Jan. 26, 1984, 59-11007; Jan. 26, 1984, 59-11008

Int. Cl.⁴ F02B *53/00*

U.S. Cl. 123—198 C **8 Claims**

1. In an internal combustion engine having a lubricant pump for delivering lubricant for a lubricant source a first drive means for driving said lubricant pump and a fuel injection pump for delivering fuel from a fuel source to the engine for combustion, second drive means for driving said fuel injection

pump, the improvement comprising means for delivering lubricant from the lubricant pump directly to components of the



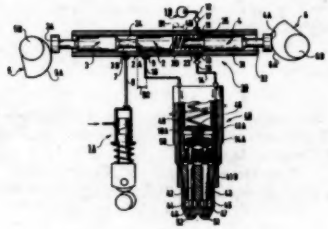
engine for lubrication and for delivering lubricant directly to the second drive means.

4,700,672

TWO-FUEL INJECTOR APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Michel Baguena, Paris, France, assignor to S.E.M.T., S.A., Saint Denis, France

Filed Mar. 11, 1987, Ser. No. 24,704
Claims priority, application France, Mar. 14, 1986, 86 03691
Int. Cl.[4] F02M *45/02*
U.S. Cl. 123—299 **9 Claims**



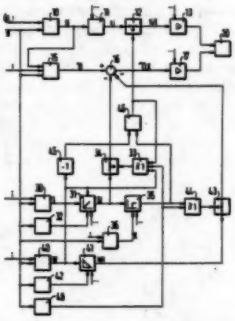
1. An injector apparatus for an internal combustion engine, the apparatus being capable of injecting two fuels, namely a "pilot injection" liquid fuel and a "main injection" liquid or gaseous fuel, the injector apparatus comprising a low-pressure pump for pilot injection fuel feed, a high-pressure injection-type pump, two fuel injectors, and a metering pump selectively connecting the low-pressure pump, the high-pressure pump, and the two fuel injectors, said metering pump including a transfer piston with one of its faces delimiting a main volume in permanent communication with the high-pressure pump and with its other face delimiting a pilot volume in permanent communication with the low-pressure pump and with the pressure chamber of the pilot injection needle, the injector apparatus including the improvement of two independently-adjustable abutments each of which limits the stroke of said piston in a respective direction, with an extreme position of the main volume abutment preventing the transfer piston from covering an orifice putting the main volume into communication with the pressure chamber of the main injector needle, and with an abutment position of the pilot volume serving to block the transfer piston.

4,700,673

METHOD OF CONTROLLING THE OPERATING CHARACTERISTIC QUANTITIES OF AN INTERNAL COMBUSTION ENGINE

Helmut Denz, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 3, 1986, Ser. No. 870,131
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521551
Int. Cl.[4] F02D *41/12, 35/00*
U.S. Cl. 123—325 **8 Claims**



3. Method for controlling the operating characteristic quantities of an internal combustion engine, comprising the steps of:

forming an injection signal for metering fuel to the engine in dependence upon said operating characteristic quantities;

generating an idle-speed charging signal for admitting an idle air flow to the engine which is likewise dependent upon said operating characteristic quantities;

detecting the overrun mode of operation of the engine;

influencing said charging signal after the commencement of said overrun mode so as to cause a reduction in the idle air flow; and,

after a predeterminable value of said charging signal is reached, changing said injection signal so as to cause the metering of fuel to the engine to be interrupted.

4,700,674

INTAKE AIR QUANTITY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES AT DECELERATION

Takahiro Iwata, Asaka, Japan, assignor to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Dec. 18, 1985, Ser. No. 810,851
Claims priority, application Japan, Dec. 20, 1984, 59-267508
Int. Cl.[4] F02M *23/06, 23/08*
U.S. Cl. 123—327 **6 Claims**

1. An intake air quantity control method at deceleration for an internal combustion engine having an intake passage, a throttle valve arranged in said intake passage, a supplementary air passage bypassing said throttle valve in said intake passage, a control valve arranged in said supplementary air passage for controlling a quantity of supplementary air to be supplied to said engine, and at least one electrical device driven by said engine, wherein rotational speed of said engine is detected and the quantity of supplementary air is controlled to a desired value when the engine is decelerated such that the detected engine rotational speed approaches a desired idling speed, the method comprising the steps of:

(a) setting a plurality of predetermined engine speed values higher than said desired idling speed value;

(b) detecting a magnitude of load applied on said engine by

said electrical device, when said engine is decelerating toward said desired idling speed value;

(c) determining which of said plurality of predetermined engine speed values the engine speed has dropped across, when said engine is decelerating toward said desired idling speed value;

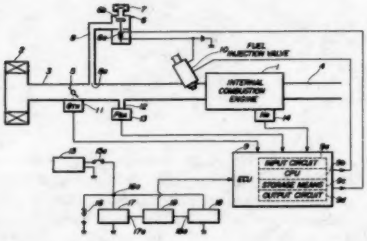
(d) detecting a decrease rate of the engine speed at one of said predetermined engine speed values across which said engine speed is determined to have dropped;

(e) determining a quantity of supplementary air supplied from said control valve corresponding to said one of said predetermined engine speed values determined at step (c) and said decrease rate detected at step (d);

(f) correcting said quantity of supplementary air determined at step (e) in dependence on the magnitude of load of said electrical device detected at step (b); and

(g) driving said control valve to open based upon said quantity of supplementary air determined at step (e).

3. An intake air quantity control method at deceleration for an internal combustion engine having an intake passage, a throttle valve arranged in said intake passage, a supplementary air passage bypassing said throttle valve in said intake passage,



and a control valve arranged in said supplementary air passage for controlling a quantity of supplementary air to be supplied to said engine, wherein the rotational speed of said engine is detected and the quantity of supplementary air is controlled to a desired value when the engine is decelerated such that the detected engine rotational speed approaches a desired idling speed, the method comprising the steps of:

(a) setting a plurality of predetermined engine speed values higher than said desired idling speed value;

(b) determining which of said plurality of predetermined engine speed values the engine speed has dropped across, when said engine is decelerating toward said desired idling speed value;

(c) detecting a decrease rate of the engine speed at one of said predetermined engine speed values across which the engine speed is determined to have dropped;

(d) determining a quantity of supplementary air supplied from said control valve corresponding to said one of said predetermined engine speed values determined at step (b) and said decrease rate detected at step (c); and

(e) driving said control valve to open based upon said quantity of supplementary air determined at step (d).

4,700,675

METHOD OF CONTROLLING FUEL SUPPLY FOR INTERNAL COMBUSTION ENGINE AT IDLE

Yutaka Otobe, Shiki; Akira Kato, Itabashi, and Masataka Chikamatsu, Asaka, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

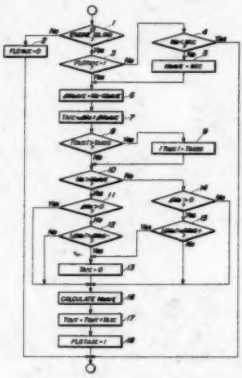
Filed May 28, 1986, Ser. No. 867,771

Claims priority, application Japan, May 31, 1985, 60-117963

Int. Cl.[4] F02M *3/07*

U.S. Cl. 123—339 **11 Claims**

1. A method of controlling the quantity of fuel to be supplied to an internal combustion engine while it is operating in an idling condition, wherein the fuel quantity is determined in accordance with operating conditions of the engine in the idling condition, and the determined fuel quantity is corrected by a correction value which is determined in response to the difference between a desired idling value of the rotational speed of the engine and an actual value thereof, the method comprising the steps of:



(1) detecting whether the rotational speed of the engine is varying toward a predetermined value or away from same;

(2) correcting said correction value to a smaller value when the rotational speed of the engine is detected to be varying toward said predetermined value; and

(3) correcting the determined fuel quantity by the correction value thus corrected.

4,700,676

INTAKE CONTROL DEVICE

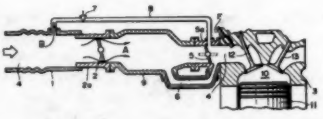
Tadashi Harashima; Hideo Morita, both of Yokohama, and Eiji Mori, Kamakura, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 31, 1985, Ser. No. 814,991

Claims priority, application Japan, Jan. 7, 1985, 60-153

Int. Cl.[4] F02M *3/12*

U.S. Cl. 123—339 **4 Claims**



1. A control device for an internal combustion engine, comprising:

a main intake passage admitting intake air to the internal combustion engine;

a throttle valve disposed in said main intake passage;

a shut off valve disposed in said main intake passage as a location downstream of said throttle valve;

an auxiliary passage having an inlet end opening to said main intake passage at a location downstream of said throttle valve and upstream of said shut off valve, and an outlet end opening to said main intake passage at a location downstream of said shut off valve;

means for controlling idle comprising a bypass passage and an idle control valve, said bypass passage having an inlet end opening to said main intake passage at a location

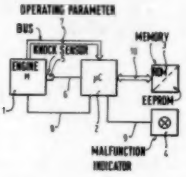
upstream of said throttle valve and an outlet end opening to the main intake passage at a location downstream of said shut off valve, said idle control valve disposed in said bypass passage to adjust the amount of air passing through said bypass passage.

4,700,677

ENGINE KNOCK CONTROL METHOD AND SYSTEM WITH FAIL-SAFE MODE

Jörg Bonitz, Mühlacker; Robert Entenmann, Benningen; Bernhard Miller, Stuttgart; Hans Rauch, Fürth; Siegfried Rohde, Schwieberdingen; Stefan Unland, Ludwigsburg, and Walter Viess, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 704,470, Feb. 22, 1985, abandoned.
This application Feb. 17, 1987, Ser. No. 16,507
Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419727
Int. Cl.[4] F02D *5/155*
U.S. Cl. 123—425 **18 Claims**



1. Method of controlling operation of an internal combustion engine (ICE) (1) close to the knocking level of the engine, utilizing

a computer (2);

means (7) providing sensed operating parameter values from said engine (1) to said computer (2);

a knock sensor (5) providing knock signals, to the computer, which have characteristics which differ in dependence on whether the engine operates under knocking or non-knocking conditions;

a programmable memory (3), having at least a non-volatile memory section, coupled to the computer,

the memory storing data representing functional relationships of operating parameters of the engine with respect to the then-pertaining operating conditions thereof,

the computer (2) receiving data, from the memory (3), relating the operating parameters of the engine to then-pertaining operating conditions and providing output control signals (8) to the engine based on data from the memory to set the operating parameters such that the engine will operating under optimum, but non-knocking, conditions, comprising the steps of:

providing in the memory a basic functional relationship of operating parameters of the engine with respect to a set of operating conditions thereof;

determining, in said computer, based on operating experience, which control settings result in knocking, and thus where, along a range of control settings, a knocking limit lies,

recording in the non-volatile section of the memory (3) adapting up-dating data which represents functional relationships associating operating parameter control setting values, under then-pertaining engine operating conditions, with engine operation just short of said knocking limit;

providing limiting values for modification of the stored functional relationships of the data in the memory;

testing whether said up-dating data have values within said limiting values and, if so, using said up-dating data to modify the functional relationship data stored in the memory and, if not, providing a malfunction indication (9, 4);

looking up in the non-volatile section of said memory (3), based on sensed operating parameter values, the thus-modified control setting data associated with operation short of the knocking limit,

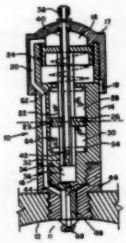
and then controlling the operating parameters of the engine in accordance with, selectively, said basic functional relationship or said modified functional relationship data, depending upon whether said malfunction indication is present or not.

4,700,678

FUEL INJECTOR

George D. Elliott, 14902 Clovercrest Dr., Huntsville, Ala. 35803

Filed Sep. 8, 1986, Ser. No. 904,378
Int. Cl.[4] F02M *49/02*
U.S. Cl. 123—297 **7 Claims**



1. An injector for delivering fuel into the combustion chamber of an internal combustion engine, said injector comprising:

means for receiving and temporarily retaining fuel;

means responsive to pressure from said combustion chamber for injecting fuel into said combustion chamber; and

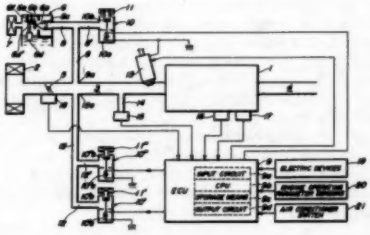
means comprising an electro-rheological fluid responsive to an electrical potential applied across said fluid for limiting the amount of fuel injected into said combustion chamber by said injection means.

4,700,679

INTAKE AIR QUANTITY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Yutaka Otobe, Shiki; Akira Kato, Itabashi; Fumio Hosoda, Utsunomiya, and Akinobu Takagi, Yokohama, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed May 28, 1986, Ser. No. 868,127
Claims priority, application Japan, May 29, 1985, 60-114282; Jun. 3, 1985, 60-120306
Int. Cl.[4] F02M *23/06*
U.S. Cl. 123—327 **8 Claims**



1. A method of controlling the quantity of intake air supplied to an internal combustion engine having an intake passage, a throttle valve arranged in said intake passage, at least one supplementary air passage bypassing said throttle valve, and control valve means arranged across said at least one supplementary air passage for controlling the flow rate of supplementary air supplied therethrough to said engine, the method comprising the steps of: (1) detecting the valve opening of said

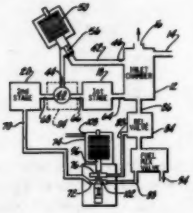
throttle valve; (2) detecting the rotational speed of the engine; and (3) controlling said control valve means in a manner such that the valve opening of said control valve means is decreased with a decrease in the rotational speed of the engine, when it is determined from the detected valve opening of said throttle valve that said throttle valve is in a substantially fully closed position and at the same time the rotational speed of the engine is higher than a predetermined value which is higher than an idling speed of the engine.

4,700,680

TWO STAGE FUEL PUMP

P. Glenn Pearce, Mobile, Ala., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 8, 1984, Ser. No. 608,175
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—383 **6 Claims**



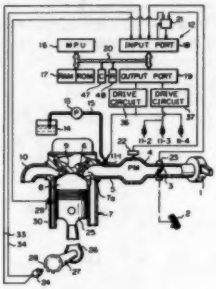
1. A fuel pump for an engine having an engine condition representative of engine speed comprising:
- a housing having a fuel inlet and a fuel outlet, said fuel inlet being open to a fuel inlet chamber formed in said housing,
- a first pump stage having an inlet open to said inlet chamber and an outlet open to an intermediate chamber formed in said housing,
- a second pump stage having an inlet open to said intermediate chamber and an outlet,
- wherein said first and second pump stages are vane pump stages and means for coaxially mechanically securing said vane pump stages together for rotation in unison with each other,
- means for fluidly connecting said second pump stage oulet to said fuel outlet,
- means for maintaining the pressure in said intermediate chamber below a predetermined maximum amount,
- wherein said maintaining means comprises means for fluidly connecting said intermediate chamber to said inlet chamber only when the pressure in said intermediate chamber exceeds said predetermined amount
- means fluidly connected to said second pump stage output and responsive to said engine condition for variably fluidly connecting said second pump stage output to said inlet chamber
- wherein said variable fluid connecting means comprises
- a return fluid passageway in said housing fluidly connecting said second stage outlet with said inlet chamber,
- an orifice in series with and at a midpoint of said return fluid passageway,
- an outlet fluid passageway fluidly connecting said orifice to said housing outlet, and
- movable valve means responsive to said engine condition for variably restricting said orifice so that fuel flow from said fluid passageway is variably divided between said return passageway and said outlet passageway as a function of the position of said valve means in amounts inversely proportional to each other.

4,700,681

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tooru Hanafusa; Yukio Kinugasa, both of Susono, and Takehisa Yaegashi, Mishima, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 7, 1986, Ser. No. 849,176
Claims priority, application Japan, Apr. 8, 1985, 60-72756; Apr. 8, 1985, 60-72758; Apr. 8, 1985, 60-72759
Int. Cl.[4] F02M *51/00*
U.S. Cl. 123—478 **12 Claims**



1. A fuel injection system for a four stroke internal combustion engine having a crankshaft, the injection system comprising:
- timing means for providing successive timing signals corresponding to preselected crankshaft angle positions in one engine cycle;
- means for injecting predetermiend amounts of fuel successive into the engine in response to preselected ones of said successive timing signals;
- first calculating means for calculating, in accordance with engine operating conditions, a basic amount of fuel to be delivered to the engine by means of a plurality of consecutive fuel injections by the injecting means;
- memory means for storing, prior to a present timing signal, data of preceding amounts of fuel injected by said injecting means upon receipt of preceding timing signals; second calculating means for calculating a final amount of fuel to be injected corresponding to a difference between the basic amount calculated by the first calculating means and the data stored in the memory of the preceding amounts of fuel; and
- means responsve to said present timing signal from the timing means for operating the injecting means for injecting a single amount of fuel corresponding to said calculated final amount of fuel.

4,700,682

FUEL VAPOR CONTROL DEVICE

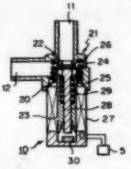
Isamu Ota, Toyota; Yutaka Nishimura, Okazaki; Shigeru Nishio, Kariya, and Kenji Yogo, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Jan. 17, 1986, Ser. No. 819,606
Claims priority, application Japan, Jan. 18, 1985, 60-004086
Int. Cl.[4] F02M *33/02*
U.S. Cl. 123—516 **2 Claims**

1. A fuel vapor control device for controlling the flow of vaporized fuel from a carburetor through a passage to a charcoal canister, said fuel vapor control device comprising:
- a valve for opening and closing the pasage between said carburetor and said charcoal canister;
- a first coil spring for urging said valve in a direction to close said passage;

a second coil spring made of a shaped memory effect alloy for urging said valve in a direction to open said passage against said first coil spring when the temperature affecting said second coil spring exceeds a predetermined value;

a solenoid coil, a cylindrical guide disposed in said solenoid coil, and an armature slidably supported in said guide, said armature moving in response to the energization and



deenergization of said solenoid coil to apply pressure against said valve and release such pressure from said valve; and

said solenoid coil heating said second coil spring above said predetermined value when said engine is running, and said armature when said engine is running exerting a force which keeps said valve shut against the force exerted by said second coil spring.

4,700,683

DEVICE FOR PURGING EVAPORATED FUEL CAPTURED BY A CHARCOAL CANISTER

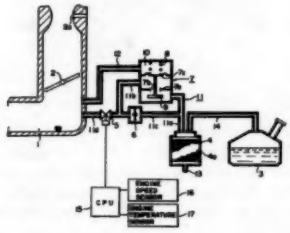
Kouji Uranishi, Susono, and Takaaki Itou, Mishima, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 10, 1986, Ser. No. 838,266

Claims priority, application Japan, Mar. 12, 1985, 60-34200[U]

Int. Cl.[4] F02M *33/02*

U.S. Cl. 123—519 **7 Claims**



1. A device for purging evaporated fuel captured by a charcoal canister from a fuel supply system of an internal combustion engine having an intake path and carburetor located in the intake path, the device comprising:

a purge path connecting said charcoal canister for capturing evaporated fuel to the engine intake path downstream of the carburetor;

an ON-OFF valve provided in said purge path; a fixed throttle arranged in said purge path in parallel with saidON-OFF valve;

means for operating said ON-OFF valve to be open at engine loads higher than a predetermined engine load and to be closed at engine loads lower than said predetermined engine load;

a solenoid valve provided in said purge path in series with said parallel arrangement of said ON-OFF valve and said throttle; and

a means for actuating said solenoid to be closed at low engine speeds and low engine temperatures and to be open at all other engine operating conditions.

4,700,684

METHOD OF CONTROLLING RECIPROCATING FOUR-STROKE INTERNAL COMBUSTION ENGINES

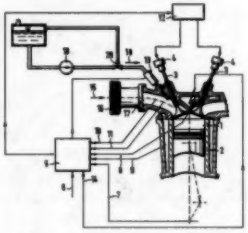
Franz Pischinger, and Peter Kreuter, both of Aachen, Fed. Rep. of Germany, assignors to FEV Forschungsgesellschaft für Energietechnik und Verbrennungsmotoren mbH, Aachen, Fed. Rep. of Germany

Filed Feb. 3, 1984, Ser. No. 576,896

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1983, 3303725

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—568 **10 Claims**



1. A method for load control of an internal combustion four-stroke engine wherein the load of the engine is controlled by the amount of fresh air and fuel supplied to the combustion chamber, the engine having at least one combustion chamber provided with intake means together with an intake line having invariable flow area dimensions outside said intake means, and exhaust means together with an exhaust line having invariable flow area dimensions outside said exhaust means by which both the opening and closing times of the inlet and exhaust means are adjustable entirely independently from each other and from the crank position, and wherein the method comprises; for the purpose of load control, indirectly controlling the amount of fresh air and fuel supplied to the combustion chamber by retaining a predetermined amount of exhaust gas in the combustion chamber after completion of the charge exchange cycle so as to reduce available combustion chamber volume for receiving said amount of fresh air and fuel during the induction process, the amount of fresh air and fuel and the amount of exhaust gas being exclusively controlled by coordinating the opening and closing times of the intake means with the opening and closing times of the exhaust means.

4,700,685

COMBINATION CONVECTION AND STEAMER OVEN

Ben Miller, Fort Wayne, Ind., assignor to Lincoln Foodservice Products, Inc., Fort Wayne, Ind.

Filed May 9, 1986, Ser. No. 861,432

Int. Cl.[4] A21B *1/08*

U.S. Cl. 126—20 **24 Claims**

1. The method for heating foodstuffs with steam in an oven, the oven including an oven cavity, a heater, means for supplying water to the oven cavity means for atomizing water in the oven cavity, a fan for conducting the atomized water over the heater to generate steam and for circulating steam in the oven cavity, and means for selectively controlling the heater, the method comprising the steps of:

continuously supplying water to said oven;

continuously atomizing said supplied water;

continuously converting said atomized water to steam;

controlling said heater to maintain said oven cavity at a selected temperature;

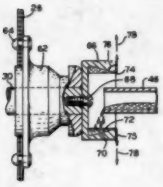
recirculating said steam in said cavity and over said heater; and

maintaining said oven cavity at atmospheric pressure.

5. In a cooking oven for cooking foodstuffs with either steam

or moist convection air, said cooking oven including an oven cavity, a heater in said cavity, air moving means for circulating air or steam in said cavity, and means for supplying water to said cavity, the improvement comprising:

a rotatable slinger cup operatively associated with said water supply means for receiving water therefrom, said



cup including an edge portion and an interior surface which tapers inversely away from said edge portion to form an included angle between the plane of said edge portion and said interior surface whereby a volume of water will collect in said cup, and whereby a layer of said water will flow over said edge and will be atomized by centrifugal force.

4,700,686

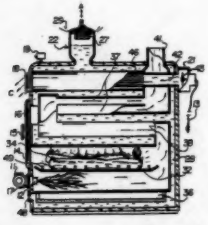
HEATING APPARATUS

Chi G. Woo, 2119 Potspring Rd., Lutherville, Md. 21093

Filed Dec. 18, 1986, Ser. No. 943,039

Int. Cl.[4] F24F *3/14*

U.S. Cl. 126—113 **7 Claims**



1. A heating apparatus comprising:

a water container,

means for introducing water to said water container, said means for introducing water to said water container including a water bottle which is vented to the atmosphere to add humidity to the room environment and to provide a safety relief valve for excess temperature and pressure,

a fire box disposed within said water container, said fire box being provided with a burner,

a plurality of heating chambers disposed in the upper portion of said water container and communicating with the room environment, said heating chamber containing heat emitting members disposed therein for absorbing heat from the water disposed in the water container,

air conduit means extending through said water container, said air conduit means connected at one end to the fire box and at the other end to the top of the container for circulating hot combustion gases therethrough and for heating the water disposed in the water container, said combustion gases being vented from said top of the container, and

fans means communicating with said heating chambers for blowing air across said heat emitting members to heat said air and discharge it to the room environment.

4,700,687

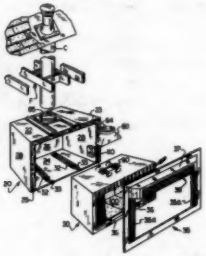
PREFABRICATED CONVERTIBLE FIREPLACE

Robert L. Bailey, and Kenneth L. Howell, both of Spruce Pine, N.C., assignors to Minpro Supply, Incorporated, Spruce Pine, N.C.

Filed Aug. 11, 1986, Ser. No. 895,272

Int. Cl.[4] F24B *7/00*

U.S. Cl. 126—121 **10 Claims**



1. A prefabricated fireplace structure for installation within the wall structure of existing building framing or new construction, and convertible between a first configuration incorporating an open fireplace and a second configuration incorporating an enclosed stove; said fireplace structure comprising:

(a) an insulating cabinet fixed within said wall structure for receiving and housing a selected one of a plurality of types of compatible fireboxes; said insulating cabinet having insulated top, bottom, side and rear walls, an open front, and a plurality of support members secured to said bottom wall and extending from front to rear on which said selected firebox rests;

(b) conduit means associated with one of said insulating cabinet walls for connecting said insulating cabinet to an associated chimney for exhausting combustion gases to the outside of the building; and

(c) a firebox completely separable as a unit and slidably resting on said support members in said insulating cabinet, said firebox including an exhaust outlet in opposed relationship to said conduit means; and a connecting means for releasably connecting the exhaust outlet of said firebox to the conduit means interiorly of said insulating cabinet, and a sealing means for substanially forming a releasale, sealed connection between said exhaust outlet and said conduit means.

4,700,688

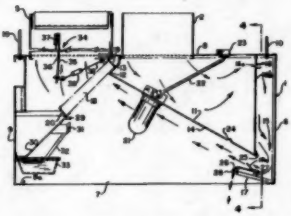
VENTILATING HOOD

James A. Searcy, Florissant; Roger O. Zoellner, Kirkwood, and Ronald C. Hoffmann, Maryland Heights, all of Mo., assignors to Cambridge Engineering, Inc., Chesterfield, Mo.

Continuation of Ser. No. 297,569, Aug. 31, 1981, abandoned, which is a continuation-in-part of Ser. No. 018,725, Mar., 1979, Pat. No. 4,286,572. This application Oct. 10, 1986, Ser. No. 918,601

Int. Cl.[4] F21C *15/08;* F23J *11/00*

U.S. Cl. 126—299 D 7 Claims



1. A fume ventilating hood for use in conjunction with a heating apparatus or the like for attaining ventilation in the region upwardly of such an apparatus and for removing its generated fumes, comprising, a housing, said housing having at least front and side walls, a top structural means for the housing, said top structural means comprising the top wall of the housing, a supply inlet communicating with said housing for conveying fresh air to the same, and an exhaust outlet communicating with the housing for removing the combined air and fumes from the region above the apparatus, a diverter means for the housing and interconnecting between the said inlet and outlet and being singularly planar in configuration and useful for directing the incoming fresh air towards the rear of the housing, a rear support for the housing and connecting in proximity with the said exhaust outlet, a shallow filter held by the said rear support, said diverter means being inclined in its positioning within the hood, with the upper end of the said diverter means being located in proximity with the rear support, and with the lower segment of said diverter means being disposed proximate the lower front of said housing, a diffuser means provided between the top wall of the housing and the approxiate lower segment of the diverter means, said diffuser means containing a slot therein extending approximately the width of the housing and useful for forming a thin film of incoming air that moves substantially in parallel along the inner side of the housing front wall and then towards the diverter means, the upper end of the singularly planar diverter means terminating within the region directly in front of the said filter so as to provide for the unencumbered and unvortexed flow of the accumulated air and fumes directly into the exhaust outlet without any obstruction other than that provided by the said filter, the relationship of the said shallow filter located within the housing providing for a flow of approximately seventy-two percent or more of untempered air through the ventilating hood, and a substantial reduction in the attraction of temperate air therethrough, and a deflecting means connecting proximately at the lower front of the housing and spaced from the lower segment of the diverter means and useful for redirecting the diverted incoming air directly towards the outlet disposed filter in parallel flow with the underside of the singularly planar diverter means for creation of an air boundary layer therewith without generating any substantial vortexing of said air for its eventual exhausting of the now combined air and fumes from the said hood.

4,700,689

COVER FOR FRYING AND COOKING APPLIANCES

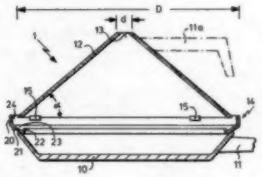
Karl J. Speker, Schickhardtstrasse 19, D 7000, Stuttgart 1, Fed. Rep. of Germany

Filed Feb. 18, 1986, Ser. No. 830,538

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1985, 3505630

Int. Cl.[4] A47J *27/58*

U.S. Cl. 126—384 11 Claims



1. A cover for frying and cooking appliances comprising in combination:

a lid of truncated and conical shape;

said lid having an upper opening and a lower opening surrounded by a lower lid rim, said lower opening being five to twenty times larger in diameter than said upper opening;

said lid comprising a wall of transparent material, said wall tapering from said lower opening at an inclination angle between 35 and 45 degrees;

a handle attached to said lid;

a toroidal collar mounted on said appliance and having an upper collar wall portion extending vertically and ending in an upper collar rim;

a first lower collar wall portion extending from below said upper collar wall portion in a downward and inward direction;

a second lower collar wall portion extending from below said first collar wall portion in an upward and inward direction and ending in a lower collar rim;

said first and second lower collar wall portions forming a circumferential channel to receive and collect condensed vapor, meat juice, and fat;

hook means having an upper hook portion attached to said upper collar wall portion and having a lower hook portion being made as a bend to allow said lid to be snapped into said hook means by introducing said lower lid rim into said bend and exerting a force on said handle in a vertical direction, said bend, in turn, exerting a holding force on said lid, in its snapped-in position to allow on the one hand said lid and said collar to be handled together by gripping said cover by said handle but allowing, on the other hand, to again manually disengage said lid from said collar;

said hook means being shaped and positioned in said collar such that when said lid is snapped into said position, said lower lid rim is retained at a vertical distance above said circumferential channel and at a lateral distance beside said upper collar wall portion;

said lower lid rim, when being in said position, intersecting a conical surface defined by said upper collar rim and said lower collar rim, thus effectively preventing fat, mean juice, or water spurting from said appliance out of said cover on the path between said lid and said collar.

4,700,690

SOLAR APPARATUS

Benjamin W. Strickland, Box 30, Joliet, Mont. 59041

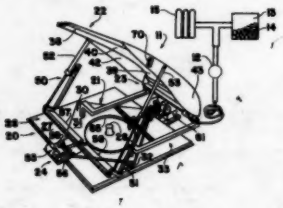
Filed Mar. 16, 1987, Ser. No. 25,940

Int. Cl.[4] F24J *2/38*

U.S. Cl. 126—424 19 Claims

1. Solar apparatus including a base portion, a supporting portion, a reflecting portion, a collecting portion and an actuat-

ing portion; said base portion including a major surface disposed in a generally horizontal plane, a pivot member extending upwardly from said major surface adjacent the center thereof; said supporting portion including a table section supported on said pivot member above said major surface and oriented substantially parallel thereto, a frame section extending upwardly from said table section; said reflecting portion including a curved reflective section extending upwardly from said frame section, a lower part of said reflective section being pivotally connected to said frame section, a concave surface of said reflective section facing toward said pivot member; said collecting portion including an elongated channel section disposed adjacent said lower part of said reflective section and substantially parallel thereto, said channel section having a curved surface facing said concave surface of said reflective section, said channel section being affixed with respect to said



reflective section and pivotable therewith; said actuating portion including extensible support assemblies extending between said table section and side edges of said reflective section, first drive means mounted on said table section adjacent an end thereof, said first drive means being operatively connected to said extensible support assemblies for changing the length thereof; second drive means mounted on said base portion remote from said first drive means, said second drive means being operatively connected to said table section and providing rotation thereof with respect to said base portion; whereby the inclination of said reflective section is adjusted by said first drive means and said extensible support assemblies and the facing of said reflective section is adjusted by said second drive means so the position of said reflective section will face the sun from morning to evening with solar radiation being reflected by said reflective section onto said collecting portion.

4,700,691

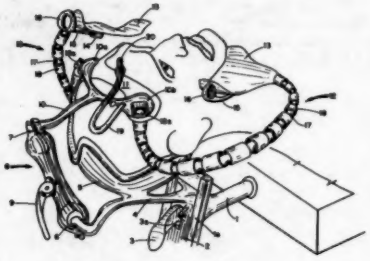
HEAD RESTRAINING DEVICE FOR OPERATING PROCEDURES ON THE HEAD

Gábor Tari, Csongrád; Gábor Bereczki, and Ferenc Blaskovics, both of Hódmezovásárhely, all of Hungary, assignors to Metripond Merleggyar, Hódmezovásárhely, Hungary

Filed Mar. 27, 1985, Ser. No. 716,573
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—1 R **10 Claims**

1. A device for restraining and supporting the head of a patient during operating procedure, comprising head immobilizing means, means for coupling said immobilizing means to the operating table, adjustable arm means coupled to said head immobilizing means, hand support means for the operating surgeon, means for coupling said hand support means to the head immobilizing means by said adjustable arm means and including means for releasing or tightening said arm means,

wherein said head immobilizing means comprises a nape support provided with a three-point bearing for the head, means for adjusting the height of said immobilizing means, a front support for clamping down the head into the nape



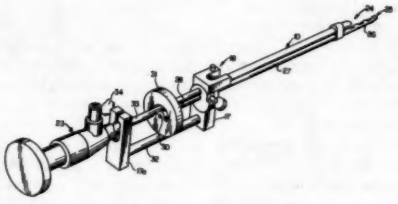
support, a hinged mechanism connecting the front support to said nape support.

4,700,692

SURGICAL IMPLANTATION METHOD AND APPARATUS

George C. Baumgartner, 41450 North West Lake Ave., Antioch, Ill. 60002

Filed Dec. 23, 1985, Ser. No. 812,334
Int. Cl.[4] A61N *5/00*
U.S. Cl. 128—1.2 **22 Claims**



1. The method of loading and discharging pellets, such as medical treatment radioactive seeds, comprising the steps of:

providing an elongated member with at least one transversely outwardly opening recess;

providing forcible ejection means in each said recess;

loading a pellet in each said recess; and

controlledly causing said forcible ejection means to discharge said pellet transversely outwardly from each said recess.

4,700,693

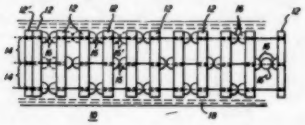
ENDOSCOPE STEERING SECTION

Raymond A. Lia, and Robert L. Vivenzio, both of Auburn, N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Dec. 9, 1985, Ser. No. 806,667
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 **15 Claims**

1. In a steerable endoscope or borescope of the type having a viewing head, a cable-bendable steering section proximally of said viewing head including a flexible sheath, a plurality of axially aligned washers each having a central passage and a plurality of peripheral bores therethrough, pairs of which are generally diametrically disposed, a plurality of steering cables passing through respective axially aligned peripheral bores of said washers, and spacer means disposed at the locations of at least certain peripheral bores associated with predetermined

cables and serving to define bending locations for said steering section such that displacement of certain steering cables results in the bending of said steering section; the improvement wherein said washers are flat planar washers and said spacer



means include pairs of hemispherical beads disposed over said predetermined cables between successive ones of said washers, said beads having spherical surfaces in rocking contact against one another and flat surfaces facing their associated washers.

4,700,694

ENDOSCOPE MEANS AND OVUM PICKER EMPLOYED BY INSERTING THROUGH ENDOSCOPE MEANS

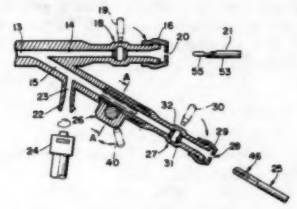
Yoshio Shishido, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,364

Claims priority, application Japan, Feb. 20, 1984, 59-30075; Feb. 24, 1984, 59-35022

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—6 **3 Claims**



1. Endoscope means having an elongated insert member which is insertable at one of its ends through a body cavity and having an observation optical system and an illuminating optical system and channels extending therethrough for receiving an operational tool from the outside of the body through said elongated member and into the body cavity in the axial direction of said elongated insert member, an inserting mouths branch at the handle side of one of said channels having a plurality of passages connecting to said one of said channels characterized by that at least one of said plurality of passages is provided with means for clamping and firmly fixing an operational tool inserted therethrough so as to prevent slidable axial movement of said operational tool in said at least one of said plurality of passages.

4,700,695

MANDIBLE MOTION APPARATUS

Christopher L. Davis; Karlean M. Davis, both of 1712 Coral Pl., Seal Beach, Calif. 90740, and Ralph C. Marshall, 539 E. Avenida, J-4, Lancaster, Calif. 93535

Filed Aug. 11, 1986, Ser. No. 895,362

Int. Cl.[4] A61H *1/02*

U.S. Cl. 128—25 R **5 Claims**

1. A mandible motion apparatus to continuously move the lower jaw relative to the upper jaw of a user, said mandible motion apparatus comprising:

first means for mounting onto the upper jaw;

second means for mounting onto the lower jaw;

cam means connected to said first and second means, said cam means being movable between a first position and a second position, with said cam means in said first position the lower jaw being closed and located in juxtaposition with the upper jaw, with the cam means in said second position the lower jaw being open and angularly displaced relative to the upper jaw; and

motor means connected to said cam means, operation of said motor means causes constant repetitive movement of said cam means between said first and second positions.

4,700,696

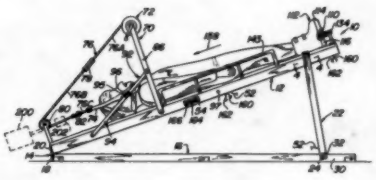
METHOD AND APPARATUS FOR APPLYING TRACTION

Charles D. Schoffstall, P.O. Box 195, Strausstown, Pa. 19559

Filed Mar. 17, 1986, Ser. No. 840,360

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—71 **32 Claims**



1. A method of administering traction therapy to an individual including the steps of supporting the individual on a body supporting platform inclined relative to a horizontal plane with the individual sloping downwardly in a direction from his or her feet to his or her head; securing the individuals feet to prevent linear movement of the individual along the downward slope of the platform; attaching a harness to an upper portion of the individuals body; and applying a force to the harness in said downwardly sloping direction, whereby traction is applied to the individual by a portion of the body weight of said individual and by said applied force.

4,700,697

CERVICAL APPLIANCE TO AMELIORATE SLEEP APNEAS

Robert D. Mundell, 542 Lucia Dr., Pittsburgh, Pa. 15221, and C. Richard Bennett, 15 Forest Glen Dr., Pittsburgh, Pa. 15228

Filed May 9, 1985, Ser. No. 732,281

Int. Cl.[4] A61H *31/00*; A61F *5/01, 5/37, 5/04*

U.S. Cl. 128—75 **6 Claims**

1. A cervical appliance for maintaining slight dorsal flexion of the head during sleep, and for preventing ventral flexion, consisting of an anterior support column with a chin cup and a scutum, a internal support interconnecting said chin cup and scutum within the support column for supporting the head against ventral flexion, and means for securing said cervical appliance to a body without restraining dorsal or lateral flexion of the head, said securing means consisting of lateral tabs each

havinag one end connected to said cervical appliance and extending backwardly around the neck of the user to a free

end, each free end carrying means to secure said free ends together such that the sole function of said tabs is to retain said cervical appliance in place at the proper position.

4,700,698

KNEE ORTHOSIS

Horst Kleylein, Sudetenstrasse 13, D-8502 Zirndorf, Fed. Rep. of Germany

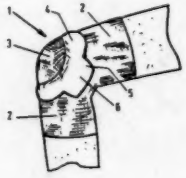
PCT No. PCT/DE85/00099, § 371 Date Dec. 5, 1985, § 102(e) Date Dec. 5, 1985, PCT Pub. No. WO85/04569, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 2, 1985, Ser. No. 811,835

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412772

Int. Cl.[4] A61F *3/00*

U.S. Cl. 128—80 C **10 Claims**



1. In a knee orthosis including a tubular stretchable fabric adapted to circumferentially surround the area of a wearer's knee, an annular pad secured to said fabric and adapted to surround the wearer's patella, the improvement comprising two lateral extensions constituting uninterrupted continuations of said annular pad and extending in opposite directions therefrom; said lateral extensions being located and dimensioned in length such that they terminate at areas beside the knee joint to leave uncovered a substantial zone of the posterior of the knee area.

4,700,699

NURSING PAD

Bruce A. Tollerud, and Carol R. Tollerud, both of 308 2nd St. SE. #203, Osseo, Minn. 55369

Filed Apr. 9, 1986, Ser. No. 849,818

Int. Cl.[4] A61F *15/00*

U.S. Cl. 128—156 **14 Claims**

1. A nursing pad for nursing women comprising:

an absorbing pad of flexible absorbent material; said absorbing pad configured to a first surface and a spaced apart second surface and a peripheral edge joining said first and second surfaces; said peripheral edge and surfaces defining a bounded volume of said absorbent material and said peripheral edge including a top edge portion, a bottom edge portion, a first side edge portion and a second side edge portion;

said absorbing pad sized for said first surface to be placed over the front of a nursing woman's breast and covering the nipple with spacing between said side edge portions sized for said side edge portions to remain on the front of said breast; said top and bottom edge portions spaced apart for said top edge portion to rest upon an upper surface of said breast and said bottom edge portion disposed against a lower surface of said breast; a layer of moisture impervious material covering said second surface and extending around said bottom edge portion, said moisture impervious material sized to extend around said bottom edge portion and extend opposing said second

surface and said side edge portions; opposing surfaces of said moisture impervious material defining a fluid containing volume at said bottom edge portion with absorbent material disposed within said volume providing a fluid reservoir; said volume having a reservoir opening facing in a direction opposing said top edge; said pad having an intended nipple opposing area for placement against said nipple when said pad is disposed upon said breast in a predetermined desired position; said moisture impervious material first terminating at a location on said surface between said bottom edge and said nipple opposing area.

4,700,700

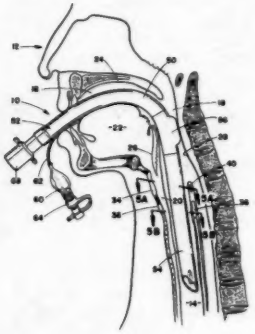
ENDOTRACHEAL TUBE

Isaac Eliachar, Pepper Pike, Ohio, assignor to The Cleveland Clinic Foundation, Cleveland, Ohio

Filed Sep. 15, 1986, Ser. No. 907,862

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.15 **13 Claims**



1. A cuffed endotracheal tube for insertion through the mouth and into the trachea of a patient to provide a passage for artificial respiration comprising:

an elongated flexible tube having an upper end portion adapted to be located external to the mouth and a lower end portion adapted to be located in the trachea;

a lower inflatable-deflatable cuff located along said tube relative to said lower end portion thereof, said lower cuff encircling said tube a predetermined distance below the

larynx and operative upon inflation to sealingly engage the inner wall of said trachea below said larynx;

an upper inflatable-deflatable cuff located along said tube a predetermined distance from said lower cuff to locate said upper cuff above said larynx, said upper cuff mounted partially on the said tube on a predetermined portion of the posterior round thereof, thereby defining a cuffed side of said tube facing the posterior portion of the pharynx and an uncuffed side of said tube facing the epiglottis, said upper cuff operative when inflated to extend outwardly from said tube to engage the posterior portion of the pharynx to move said uncuffed side of said tube toward the epiglottis said movement effecting alignment of said tube relative to the laryngeal passage to prevent contact between said tube and the posterior region of said larynx; and

means for separately inflating and deflating the upper and lower cuffs, said cuffs dimensioned to avoid contact with the larynx when inflated and positioned in the patient.

4,700,701

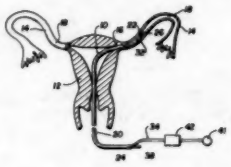
STERILIZATION METHOD AND APPARATUS

David H. Montaldi, 800 W. Jefferson, Kirksville, Mo. 63501

Filed Oct. 23, 1985, Ser. No. 790,532

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.17 **26 Claims**



1. A sterilization device for destroying the mucosal lining of the fallopian tube in females comprising:

cautery means vaginally insertable into the fallopian tube of the female for destroying a portion of said mucosal lining at a selected location;

means absorbable over a selected time interval carried with and vaginally insertable simultaneously with said cautery means into the fallopian tube at said selected location including a distal plug means and proximal scarification means, said scarification means for scarifying the fallopian tube radially from a muscular layer thereof, whereby the scarification blocks the fallopian tube and said plug means for blocking peritoneal infiltration of by-products of said cauterization and scarification outside the fallopian tube during the absorption interval.

4,700,702

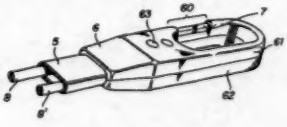
INSTRUMENT FOR CUTTING TISSUES IN SURGERY

Tatiana Nilsson, Harpungränd 16, S-17547 Järfälla, Sweden

Filed Dec. 9, 1985, Ser. No. 806,645

Int. Cl.[4] A61F *17/32*

U.S. Cl. 128—305 **17 Claims**



1. A surgical instrument for cutting tissue comprising:

(a) motor means;

(b) a cutting tool comprising of flexible arcuate blade extending along a longitudinal direction, wherein a portion of said blade is exposed along a portion of said longitudinal direction;

(c) means for coupling said motor means to said cutting tool wherein said motor means and said coupling means comprise means for reciprocating said blade in said longitudinal direction

(d) a sheath surrounding said cutting tool;

(e) two rods for linking the coupling means and the cutting tool;

wherein said sheath has an aperture therein to expose said portion of said blade, wherein guiding of the blade is assured by the sheath.

4,700,703

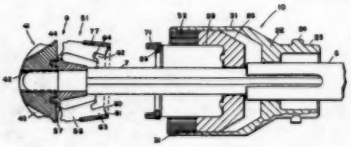
CARTRIDGE ASSEMBLY FOR A SURGICAL STAPLING INSTRUMENT

Semion Resnick, 47b Deganiot Street, Kiriat Tivon 36 000, and Jacob Goldman, Naharya, both of Israel, assignors to Semion Resnick, Kiriat Tivon, Israel

Filed Mar. 27, 1986, Ser. No. 844,949

Int. Cl.[4] A61B *17/10*

U.S. Cl. 128—334 R **4 Claims**



1. In a disposable cartridge assembly for a surgical stapling instrument, an anvil carrying component comprising constituent anvil segments, each segment being integrally secured at one end thereof to a central hub portion by a relatively flexible linkage and being formed, at an opposite end thereof with a component anvil surface so as to form together a composite anvil surface, each anvil segment being formed, adjacent said opposite end with a slot which together form a groove, said segments being flexibly displaceable between a retracted and an expanded position; a compression band tightly fitted around said segments for biasing said segments into said retracted position wherein said composite anvil surface has a first diameter, and a locking ring adapted to fit into said groove so as to maintain said segments in their expanded position wherein said composite anvil surface has a second larger diameter, said ring being formed with a succession of tooth-like projections adapted to project into the spaces between the segments so as to prevent movement of the segments with respect to each other and being formed of a semi-rigid plastics material such that it can be penetrated by an instrument scalpel knife edge which is thereafter frictionally gripped by the ring material, the arrangement being such that upon displacement of said instrument scalpel gripped by said ring material away from said anvil carrying component said locking ring is disengaged from said anvil segments and the latter are displaced under said biasing force into said retracted position.

4,700,704

SURGICAL ARTICLES OF COPOLYMERS OF GLYCOLIDE AND ε-CAPROLACTONE AND METHODS OF PRODUCING THE SAME

Dennis D. Jamiolkowski, Long Valley, and Shalaby W. Shalaby, Lebanon, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 432,176, Oct. 1, 1982, abandoned. This application Aug. 12, 1985, Ser. No. 764,818
Int. Cl.[4] A61L *17/00*
U.S. Cl. 128—335.5 14 Claims

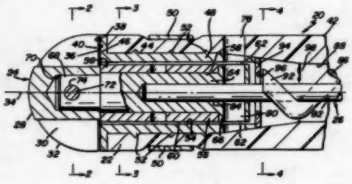
1. A sterile surgical suture made from a polymeric material having a melting point of 213° C. or less, said polymeric material comprising from about 20 to 35 weight percent epsilon (ε)-caprolactone and from about 65 to 80 weight percent glycolide based sequences, said suture having a tensile strength of at least 30,000 psi and a Young's modulus of less than 350,000 psi.

4,700,705

CATHETER BASED SURGICAL METHODS AND APPARATUS THEREFOR

Kenneth Kensey, Hinsdale, Ill., and John Nash, Downingtown, Pa., assignors to Intravascular Surgical Instruments, Inc., Frazer, Pa.

Continuation-in-part of Ser. No. 765,034, Aug. 12, 1985, Pat. No. 4,664,112. This application Oct. 3, 1986, Ser. No. 914,954
Int. Cl.[4] A61M *29/00*
U.S. Cl. 128—341 5 Claims



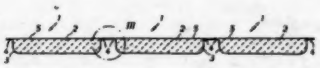
1. A method of dilating a portion of lumen in a living body utilizing an elongated, small diameter, flexible catheter having a longitudinal axis and a distal end at which a working head is located, said working head being arranged for high speed movement with respect to said axis by associated drive means, said lumen portion including undesirable material located therein which may be loosened by the dilation action of said working head, said drive means being arranged to freely effect the movement of said working head even if said catheter is bent through an arc up to a minimum radius of curvature and without resulting in excessive vibration which could interfere with the lumen-dilating action, said method comprising inserting said catheter into said lumen from a remote location, causing said drive means to rotate said working head about said axis at a high rate of speed and advancing said catheter into said lumen along said axis to said portion of said lumen as said working head is moving whereupon the mechanical action of said working head causes said portion of said lumen to be enlarged and wherein said working head causes any loosened materials to be of such sufficiently small size that they are permitted to pass distally of said lumen portion without causing significant deleterious effect to bodily tissue.

4,700,706

COLD AND WARM PACK FOR PHYSIOTHERAPY AND THE LIKE

Walter Münch, Mirabellenweg 2, 7031 Gäufelden 2, Fed. Rep. of Germany

Filed Feb. 3, 1986, Ser. No. 825,336
Int. Cl.[4] A61F *7/10*; F25D *3/08*
U.S. Cl. 128—403 23 Claims



1. A temperature storage pack for physiotherapy and the like, comprising: a tightly bonded sleeve made from a flexible foil, the foil having two tightly-bonded together foil portions, one of the portions being cup-shaped and having a peripheral flanged edge, the other of the portions being planar and having a periphery bonded to the flanged edge of the cup-shaped portion, the cup-shape portion being deep-drawn; and,

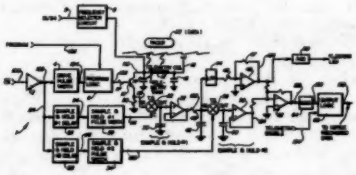
a temperature-storing filling in the sleeve, the sleeve being only filled to part of its filling capacity and substantially without the inclusion of air, the filling being a kneadable, non-freely flowing filling material having no discrete bodies large enough to be visible to the eye.

4,700,707

PULSE TO SINE WAVE/SAMPLE DECODER TELEMETRY SYSTEM

William P. Batina, and Lamar H. Gipson, both of Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Dec. 9, 1985, Ser. No. 806,483
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 PT 20 Claims



1. A telemetry system for communicating with a tank circuit contained in a pacer implanted in a patient comprising:

telemetry coil being positionable externally on the patient's skin in proximity to the implanted pacer;

capacitive means connected to said telemetry coil for forming a resonant tank;

said resonant tank having a varying impedance in response to telemetered data signals from the implanted tank circuit;

clocking means for generating drive current pulses at a selected frequency to be applied to said resonant tank;

switching means for generating a pulse waveform having a varying amplitude and frequency in response to the drive current pulses and to the varying impedance of said resonant tank;

means sampling the pulse waveform of varying amplitude and frequency to provide a sample and hold signal; and

output means coupled to said sampling means for recovering of the telemetered data signals in the form of a binary pulse-width modulated signal.

4,700,708

CALIBRATED OPTICAL OXIMETER PROBE

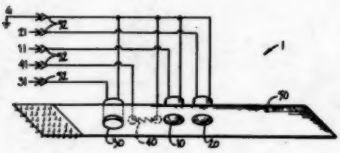
William New, Jr., Woodside, and James E. Corenman, Alameda, both of Calif., assignors to Nellcor Incorporated, Hayward, Calif.

Continuation of Ser. No. 827,478, Feb. 5, 1986, Pat. No. 4,621,643, which is a continuation of Ser. No. 695,402, Jan. 24, 1985, abandoned, which is a continuation of Ser. No. 414,176, Sep. 2, 1982, abandoned. This application Sep. 26, 1986, Ser. No. 911,978

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—633 11 Claims



1. An oximeter probe system for use with an oximeter, said system comprising:

a first light emitting means emitting light having a first known wavelength value;

means for sensing the light emitted by said first light emitting means;

means for detachably wiring the probe to the oximeter and for providing communication of electrical signals between the probe and the oximeter; and

encoding means for providing signals to the oximeter which are indicative of the known wavelength value of said first light emitting means.

4,700,709

APPARATUS AND METHOD FOR DETERMINING AMMONIUM ION CONCENTRATION AND TOTAL AMMONIA CONCENTRATION IN FLUIDS OR TISSUE

Richard P. Kraig, New York, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jan. 30, 1986, Ser. No. 824,349

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—635 18 Claims

1. Apparatus for determining the concentration of ammonium ion in fluid or tissue without adjusting the pH thereof, said apparatus comprising

(a) an ammonia concentration measuring electrode for contacting said fluid or tissue and producing a first output signal related to ammonia concentration therein,

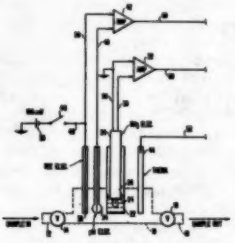
(b) a hydrogen ion concentration measuring electrode for contacting said fluid or tissue and producing a second output signal related to hydrogen ion concentration therein,

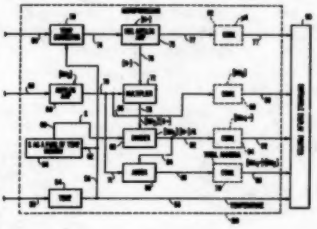
(c) temperature measuring means for contacting said fluid or tissue and producing a third output signal related to temperature therein,

(d) means for calculating ammonium ion concentration based upon said first, second and third output signals utilizing the equation

$$[NH_4^+] = \frac{[NH_3]\,[H^+]}{K}$$

where K is the equilibrium constant for the reaction $NH_3+H^+ \rightleftarrows NH_4^+$ at the temperature measured by element (c).





4,700,710

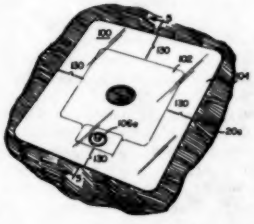
APERTURED ADHESIVELY APPLIED BODY ELECTRODE APPARATUS AND METHOD

Kent C. Hoffman, Cockeysville, Md., assignor to Murray Electronics Associates Limited Partnership, Hunt Valley, Md.

Filed Mar. 12, 1985, Ser. No. 711,044

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—641 5 Claims



1. A flexible electrode for therapeutic or diagnostic applications which may be adhesively affixed to the external body surface of a subject prior to the application of electrically conductive electrode preparations between the body surface and the flexible electrode, said flexible electrode comprising:

a conductive patch having a substantially flat body-engaging flexible conductive foil surface for engagement with the body surface and which is in a flexible sheet form;

an electrical terminal affixed to said conductive patch and adapted for connection to an electrical lead;

a flexible insulating sheet having lateral dimensions in excess of the corresponding lateral dimensions of said conductive patch and having an adhesive covering on one side

thereof, said conductive patch being affixed thereto on said one adhesive side;

the margins of said sheet, said adhesive on said one side and said conductive patch defining an adhesive boundary about said electrode for adhesive affixation of said flexible conductive surface to the body surface in a taut extended condition;

each of said flexible conductive foil and said sheet having at least one aperture extending completely therethrough and aligned one with the other for providing open access through the entire flexible electrode to the body surface after adhesive affixation thereto to enable application of the electrically conductive electrode preparation through the aligned apertures into the area between the body surface and the said body engaging flexible conductive surface; and

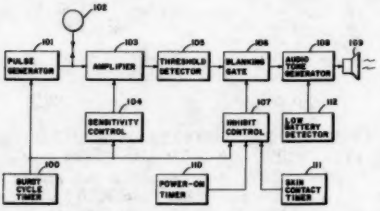
a release liner releasably attached to and covering the otherwise remaining exposed adhesive backing of said sheet defining said boundary and the otherwise exposed side of said conductive patch prior to its intended use.

4,700,711

ULTRASONIC DETECTOR WITH INTEGRAL CONFIDENCE TESTS

David L. Carlson, Ames, Iowa, assignor to Renco Corporation, Minneapolis, Minn.

Filed Nov. 22, 1985, Ser. No. 801,080
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **8 Claims**



1. Ultrasonic sensing apparatus for measurements of animals' bodies, comprising:

means including a transducer adapted to be placed against the skin of an animal for transmitting ultrasonic energy bursts and for providing energy signals corresponding to said transmitted ultrasonic energy bursts and echo signals corresponding to return echoes from the body;

signal processing means including electrical measurement and detection means connected for receiving said energy signals and echo signals and for detecting and measuring features thereof corresponding to anatomical features within the animal's body and indicating means operatively connected to said electronic measurement and detection means for providing indications to an operator of characteristics of the detected or measured anatomical features;

gate means operatively connected to said signal processing means and selectively operable in a first mode to suppress energy signals and echo signals occurring in a time period during and immediately after each ultrasonic pulse and corresponding in time to transmitted energy bursts and return echoes from the skin of the animal respectively, and selectively operable in a second mode to suppress energy signals occurring in said time period, and selectively operable in a third mode to pass all energy signals and echo signals; and

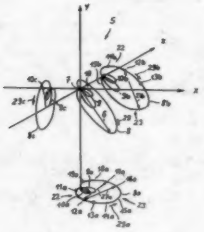
switching means connected for controlling said gate means for normally operating in said first mode so that said signal processing means may indicate characteristics of the detected or measured anatomical features with the body, and for periodically switching said gate means to said second mode so that said indicating means will provide the operator with an indication of effective skin contact by the transducer, and for switching said indicating means to said third mode so that said indicating means will provide the operator with an indication of proper operation of the entire circuit.

4,700,712

METHOD FOR DETERMINING THE STARTING POINT AND THE END POINT OF CLOSED SPATIAL SIGNAL PATTERNS

Johann J. Schmid, Buchs, Switzerland, assignor to Willi Studer AG, Regensdorf, Switzerland

Filed Aug. 15, 1986, Ser. No. 896,835
Claims priority, application Switzerland, Aug. 30, 1985, 03734/85
Int. Cl.[4] A61B *5/04*; G06F *15/42*; G06G *7/60*
U.S. Cl. 128—699 **8 Claims**



1. A method of determining the starting point and the end point of a spatial closed signal pattern in a time sequence of individual ones of such spatial closed signal patterns, each of which is constituted by a series of signals measured at predetermined moments of time, said method comprising the steps of:

determining a predetermined number of spatial slope values for each one of a predetermined number of the spatial closed signal patterns;

selecting a preselected sequence of consecutive spatial slope values for each one of said predetermined number of spatial closed signal patterns;

mutually correlating the preselected sequences of consecutive spatial slope values of said predetermined number of spatial closed signal patterns and classifying said sequences into different correlation classes in accordance with their mutual correlation;

said step of mutually correlating said preselected sequences of consecutive spatial slope values includes mutually correlating said preselected sequences of consecutive spatial slope values at a predetermined temporal offset between individual ones of said preselected sequences of consecutive spatial slope values;

forming a sequence of consecutive weighted average spatial slope values for each correlation class of said mutually correlated sequences of consecutive spatial slope values;

determining a minimum spatial slope value within each end region of each said sequence of consecutive weighted average spatial slope values; and

determining by means of each said minimum spatial slope value of each said sequence of consecutive weighted average spatial slope values and said predetermined temporal offset between individual ones of said preselected sequences of consecutive spatial slope values, the minimum spatial slope values of each said preselected sequence of consecutive spatial slope values and thereby the starting points and the end points of each related one of said predetermined number of spatial closed signal patterns.

4,700,713
DEVICE FOR OBTAINING A SMEAR SAMPLE FROM A BODY CAVITY

Joost Kist, Amsterdam, Netherlands, assignor to Futura Nova B.V., Amsterdam, Netherlands

Filed Dec. 30, 1986, Ser. No. 947,827

Claims priority, application Netherlands, Dec. 31, 1985, 8503596

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—756 **13 Claims**

1. A device for obtaining a smear sample from a body cavity, in particular the uterus mouth or cervix, comprising

an elongated stem;

a carrier at one end of the stem;

a plurality of bristles projecting from the carrier and extending substantially parallel to the stem the bristles each having at least one longitudinal sharp edge, adapted to scrape cells from the body cavity when the device is rotated about the stem axis.

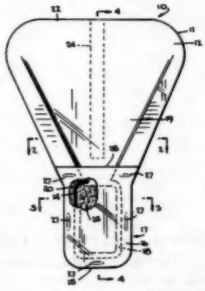
4,700,714
URINE COLLECTING DEVICE

Richard C. Fuisz, 4146 Green Pond Rd., Bethlehem, Pa. 18017

Continuation of Ser. No. 644,442, Aug. 27, 1984, abandoned. This application Oct. 23, 1986, Ser. No. 921,833

Int. Cl.[4] A61B *5/00*; B65D *81/00*

U.S. Cl. 128—767 **9 Claims**



1. A urine collecting and sampling device comprising in combination first and second parts for disposition within an article of clothing such that when on the wearer said first and second parts are located adjacent, respectively, the perineum and genitalia, said first part being in the form of an enclosure defining a compartment of predetermined volume with side walls of shallow height, said enclosure being configured and dimensioned to fit within the perineum region and having at least one unobstructed opening in a side wall for admitting urine to said compartment, a body of dry compressed absorbent material smaller than said compartment disposed within said compartment but not otherwise confined therein, said body if unconfined by said compartment being expandable when wet to an uncompressed volume that would exceed said predetermined volume, but when in said compartment said body is able to expand only until constrained by said enclosure, and said second part comprising a panel of liquid impermeable material including at least one channel for guiding urine directly to said opening, for free direct access to said adsorbent body, said panel being joined to and extending from said first part, the relationship between said adsorbent body and said compartment dimensions being such that said body will absorb a controlled quantity of urine.

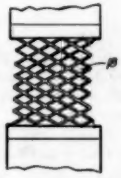
4,700,715
DEVICE FOR DETECTING NOCTURNAL PENILE ERECTIONS

Robert A. Levine, 31 Pilgrim La., Guilford, Conn. 06437, and Stephen C. Wardlaw, 191 North Cove Rd., Old Saybrook, Conn. 06475

Filed Nov. 23, 1981, Ser. No. 324,073

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—774 **16 Claims**



1. A device for detecting nocturnal penile erections, said device comprising: an elongated band of sheetlike material adapted to snugly encircle a flaccid penile shaft; said band having one end portion provided with a plurality of spaced indicia markings with the other end of said band being adapted to overlie said one end portion when said band encircles the flaccid penile shaft to provide an indication of the circumferential dimension of the flaccid penile shaft; adhesive means on said band to secure said ends of said band in overlying relationship; and means providing a dimensionally restricted expansion portion medially on said band, said expansion portion being operable to expand in the direction of elongation of said band during transition of the penis from the flaccid to the erection state to increase the dimension of said band in said direction of elongation, and said expansion portion comprising a substantially non-resilient material whereby the increased direction of elongation dimension is retained during retransition of the penis from the erection to the flaccid state.

4,700,716
COLLINEAR ANTENNA ARRAY APPLICATOR

Raymond S. Kasevich, Weston; James F. McQueeney, Natick, and Ronald H. Crooker, Stoneham, all of Mass., assignors to Kasevich Associates, Inc., Woburn, Mass.

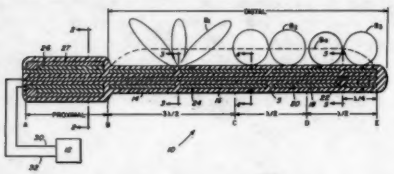
Filed Feb. 27, 1986, Ser. No. 834,199

Int. Cl.[4] A61N *5/02*

U.S. Cl. 128—804 **9 Claims**

1. A microwave collinear antenna array applicator having a proximal end which is adapted to be coupled to a source of microwave energy and an extended distal region for applying said energy for hyperthermia treatment comprising a plurality of harmonically related resonant coaxial antenna elements forming said distal region, said elements formed of an inner conductor having a distal end in the distal region and an outer coaxial conductor with a distal end in the distal region, said elements being electrically connected in series to provide a uniform heating pattern of microwave radiation along the length of the distal region of the applicator and wherein the

proximal end includes an impedance matching means comprising a dielectric tube encircling the outer coaxial conductor and



a conductive sheath around the dielectric tube in contact with the proximal end of the outer coaxial conductor.

4,700,717

SELF-PROPELLED HARVESTER THRESHER

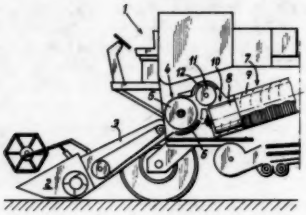
Heinrich Roderfeld, and Johannes Dammann, both of Harsewinkel, Fed. Rep. of Germany, assignors to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed May 14, 1985, Ser. No. 734,386

Claims priority, application Fed. Rep. of Germany, May 15, 1984, 3417929

Int. Cl.[4] A01F *7/04*

U.S. Cl. 130—27 T **10 Claims**



1. A self-propelled harvester thresher, comprising a threshing mechanism operating with a tangential product flow and extending transversely to a travelling direction, said threshing mechansim having a threshing drum rotatable about an axis of rotation, and a threshing basket associated with said threshing drum; a separating device extending in the travelling direction, located after said threshing mechansim in a direction of product flow and operating with an axial product flow, said separating device having at least one separating rotor having a receiving region, and at least one housing associated with said separating rotor; and a transferring mechanism for transferring the product, without its threshing or separating, from said threshing mechansim extending transversely to the travelling direction to said separating device extending in the travelling direction, said transferring mechanism including a transferring drum arranged between said threshing mechanism and said separating device and rotatable about an axis which lies higher than the axis of rotation of said threshing drum of said threshing mechanism and higher than said receiving region of said separating rotor of said separating device, and a guiding member surrounding at least partially said transferring drum, said guiding member being provide with a plurality of guiding skids.

4,700,718

THRESHING METHOD AND EQUIPMENT INTENDED FOR ITS APPLICATION

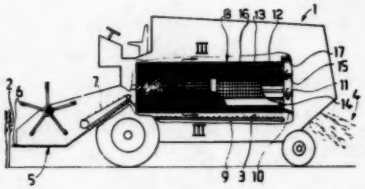
Vilppu U. Rissanen, Mutainen, Finland, assignor to Oljynpuristamo Oy, Helsinki, Finland

Continuation of Ser. No. 652,960, Sep. 21, 1984, abandoned. This application May 19, 1986, Ser. No. 866,987

Claims priority, application Finland, Sep. 23, 1983, 833408

Int. Cl.[4] A01F *12/44*

U.S. Cl. 130—27 R **5 Claims**



1. Apparatus for threshing plant material to separate seeds therefrom, comprising a central cylindrical roller which is rotatable in one direction and provided with flails on its outer periphery, a hollow flail bridge cylinder which is rotatable in a direction opposite to that of said central roller, said flail bridge cylinder cooperating with said flails on said central roller to separate seeds from said plant material and to define an annular space therebetween; means for rotating said central roller and said flail bridge cylinder in opposite directions with the rotational speed of the roller being greater than the rotational speed of said cylinder, means for axially feeding said plant material into said annular space, means for gathering seeds separated by the opposed rotation of said roller and cylinder, an outer rotatable cylindrical drum screen surrounding said flail bridge cylinder for cleaning the seeds separated through said flail bridge cylinder, a rotatable brush roll located against the inner surface of the screen, and screw means provided in said screen for axially transferring screen waste towards the rear of said screen.

4,700,719

CONTROL OF CIGARETTE ROD FORMATION

Michael H. Sheahan, Toronto, Canada, assignor to Rothmans of Pall Mall Limited, North York, Canada

Filed May 13, 1986, Ser. No. 862,700

Claims priority, application United Kingdom, May 15, 1985, 8512293; Jul. 25, 1985, 8518782

Int. Cl.[4] A24C *5/39, 5/18*

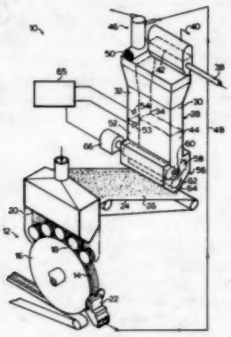
U.S. Cl. 131—84.4 **18 Claims**

6. A cut tobacco hopper device for use in conjunction with a cigarette making machine, which comprises:

a reservoir vessel having an upper inlet for tobacco and a lower outlet and having divider means located therein separating the interior of the reservoir vessel into side-by-side vertically-extending physically-separated reservoir chambers which are out of communication one with another, and

common metering and feeding means located in operative

relationship with the lower outlet for metering and feeding tobacco simultaneously from both said reservoir



chambers through said lower outlet at the same rate per unit reservoir width.

4,700,720

KNIVES IN CUTTING MACHINES

Eric T. Ray, Andover, England, assignor to AMF Incorporated, Minneapolis, Minn.

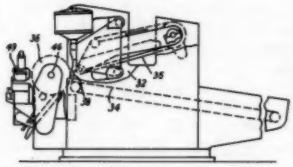
PCT No. PCT/GB85/00134, § 371 Date Jul. 15, 1985, § 102(e) Date Jul. 15, 1985, PCT Pub. No. WO85/04616, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 1, 1985, Ser. No. 754,599

Claims priority, application United Kingdom, Apr. 9, 1984, 8409157

Int. Cl.[4] A24B *3/07*

U.S. Cl. 131—118 **6 Claims**



1. A knife for a cutting machine comprising a plate having one major surface bevelled to form a cutting edge and a plurality of grooves formed at right angles to the cutting edge in the other major surface of the knife which is not bevelled thereby providing ribbed portions and a crenellation of said cutting edge such that the latter has alternate identical narrow leading cutting edge portions 0.5–2 mm wide (G) and relatively wide identical trailing cutting edge portions 6.35–38.1 mm wide, said groove having a depth (F) such that the strain (S) induced by each leading cutting edge portion on the cut strand in the region of each leading cutting edge portion is from 1.6 to 6.4 as derived from the equation $S=2F$.

4,700,721

CIGARETTE INCENSE ASHTRAY HOLDER

Dennis B. Grooms, Jr., 1075 Castleton Ave., 2C, Staten Island, N.Y. 10310

Filed Oct. 14, 1986, Ser. No. 899,965

Int. Cl.[4] A24F *19/00*

U.S. Cl. 131—238 **1 Claim**

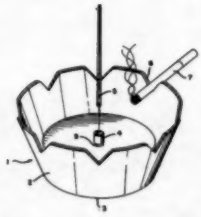
1. An ashtray comprising:

(a) an ash receiving means having a base;

(b) a hole through said base;

(c) an aluminum tube fitted snugly into said hole;

(d) said aluminum tube having a first end inserted into said hole and a second end above said hole when first end is inserted;



(e) said tube at said first end being plugged by a piece of clay;

(f) an incense stick inserted into said tube and into said clay so as to secure said incense stick in said tube.

4,700,722

PROCESS FOR RETAINING ALKALOIDS BY TREATING WITH STRONG ACIDS BEFORE DRYING

Kevin R. Korte; Elmer Litzinger, both of Louisville, Ky., and Dan T. Wu, Surabaya, Indonesia, assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed May 12, 1986, Ser. No. 861,897

Int. Cl.[4] A24B *15/20, 15/28*

U.S. Cl. 131—309 **8 Claims**

1. A process of treating tobacco to inhibit alkaloid loss comprising the steps of:

adding a selected quantity of an aqueous solution of a strong acid to a selected quantity of tobacco;

drying the tobacco until the moisture content is less than 16 percent by weight of the tobacco; and

adding an aqueous solution of a weak base in a sufficient amount to neutralize the added acid.

4,700,723

TOBACCO FILTER AND FIBROUS ION EXCHANGE RESIN

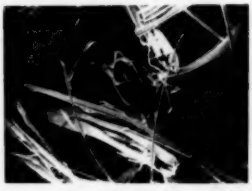
Seiichi Yoshikawa, Shiga; Toshio Yoshioka, and Masaharu Shimamura, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jan. 20, 1984, Ser. No. 572,382

Claims priority, application Japan, Mar. 10, 1983, 58-39755

Int. Cl.[4] A24D *3/12*

U.S. Cl. 131—334 **18 Claims**



1. A filter for tobacco smoke which comprises an ion exchange fiber, wherein an ion-exchangeable component itself forms a fibrous structure, the ion-exchangeable component being substantially water-insoluble.

4,700,724

SMOKING-ARTICLES MOUTHPIECES-ELEMENTS

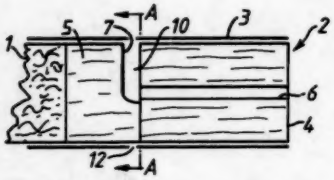
Henry G. Horsewell, Totton, and Martin G. Duke, Southampton, both of England, assignors to British-American Tobacco Company Limited, London, England

Filed Nov. 14, 1984, Ser. No. 671,221

Claims priority, application United Kingdom, Nov. 18, 1983, 8330894

Int. Cl.[4] A24D 3/04

U.S. Cl. 131—336 9 Claims



1. A smoking article mouthpiece element for the downstream end of a tobacco column which comprises: a first element portion and a second element portion together being defined by an outer peripheral wall, said first portion being defined by a downstream end and an upstream end, a peripheral wall extending between said ends, a longitudinal duct with a gas impervious duct wall extending between said ends, said duct opening at said upstream and downstream ends at respective locations spaced from said peripheral wall of said element, and a smoke passage separate from said longitudinal duct extending between said ends, said second portion disposed at the upstream end of said first portion, the interior of said second portion being open at the upstream end of said second portion and communicating directly at its downstream end with said smoke passage of said first portion, at least one of said portions containing filtr material, and a transversal air passage disposed at or near to the junction of said first and second portions, said air passage being open through the peripheral wall of the element to ambient air and extending inwardly from the wall opening to the longitudinal duct at the upstream end of said first portion for connecting said longitudinal duct to the ambient air whereby only ambient air flows through said longitudinal duct.

4,700,725

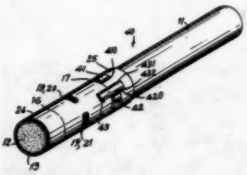
ADJUSTABLE FILTER CIGARETTE

Willard A. Geiszler, Jr., Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 17, 1986, Ser. No. 853,142

Int. Cl.[4] A24D 3/04

U.S. Cl. 131—336 7 Claims



1. A filter cigarette comprising a tobacco rod, a substantially cylindrical filter plug having a mouth end and a rod end open to the passage of air and smoke, plug wrapping circumscribing said filter plug, and tipping paper circumscribing and joining said filter plug and a portion of said tobacco rod, at least one of said plug wrapping and said tipping paper being substantially air-impermeable, said filter plug comprising a mouth-end segment axially connected to a rod-end segment for rotation about the axis of the cigarette, each of said segments having respective mouth and rod ends, said tipping paper having a first opening therein and said plug wrapping having a second opening therein underlying said first opening, said openings overlying one of said mouth-end and rod-end segments, such that rotation of said mouth-end segment relative to said rod-end segment varies the registry between the first and second openings for varying the air dilution value of said filter cigarette, said filter cigarette further comprising positive stop means for restricting the relative rotation of said segments to a desired rotational range.

4,700,726

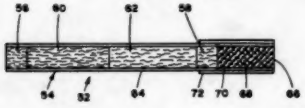
CIGARETTE RODS HAVING SEGMENTED SECTIONS

David E. Townsend, Winston-Salem; Diane R. Frye, King; Tammie B. Greene, and Thomas A. Perfetti, both of Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed May 2, 1986, Ser. No. 858,790

Int. Cl.[4] A24D 1/00, 1/18

U.S. Cl. 131—364 23 Claims



1. A rod suitable for the manufacture of a cigarette, said rod comprising smokable filler material contained in a wrapping material and having the two ends thereof open to expose the filler material, said rod further comprising four segments of filler material, each segment being defined by its density, wherein

(i) the first segment is disposed at the extreme end of the rod which is to be lit;

(ii) the second segment is disposed at the end of the rod opposite the end which is to be lit;

(iii) the third segment is disposed adjacent to the first segment; and

(iv) the fourth segment is disposed adjacent to the second segment;

wherein each of the third segment and the fourth segment has a substantially uniform density in the region along the longitudinal axis of the rod and across the rod in a plane perpendicular to the longitudinal axis thereof, and the density of the fourth segment is less than that of the third segment such that the density differential therebetween is at least about 15 percent.

4,700,727

METHOD OF TREATING LETTUCE AND OTHER LEAFY VEGETABLE PLANTS AND PRODUCTS PRODUCED THEREFROM

Puzant C. Torigian, Fort Lee, N.J., assignor to Challenger Industries, Ltd., Fort Lee, N.J.

Filed Dec. 20, 1985, Ser. No. 811,333

Int. Cl.[4] A24B 15/20, 1/18

U.S. Cl. 131—369 14 Claims

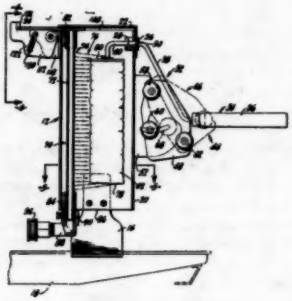
1. A method of treating lettuce and leafy vegetable plants to produce tobaccoless smokes therefrom which comprises washing and shredding untreated lettuce and leafy vegetables and subjecting the shreds to the action of enzymes which break down their proteinaceous content, adjusting the moisture and temperature thereof and slightly acidifying the resulting shreds to a pH value of 3–6 and then imparting to the resulting material a desired color, taste, odor and physical form.

4,700,728

DEVICE FOR CLEANING PAINT ROLLERS

Charles E. Patterson, 1412 6th St., Berkeley, Calif. 94710

Filed Sep. 3, 1985, Ser. No. 771,611
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—138 2 Claims



1. A device for cleaning a paint roller having a handle and a paint engaging roll comprising:

a. a housing for enclosing the roll;

b. means for mounting the roll in said housing, said roll mounting means permitting rotation of the roll in relation to the roller handle including a mounting surface provided by said housing and a clamp supporting the handle of the paint roller, said clamp further including means for rotation of said clamp and the handle supported therein about an axis, said mounting surface of said housing serving as a fulcrum for rotation of the handle and the roll within said housing connected thereto, a pair of plates disposed on opposite sides of said handle of said paint roller, and at least one tensioning fastener spanning said pair of plates, a third plate fixed in relation to said housing, said third plate including an elongated slot, said pair of plates including openings alignable with said third plate slot such that said tensioning fastener is movable along said slot and is capable of forcing said pair of plates toward said third plate;

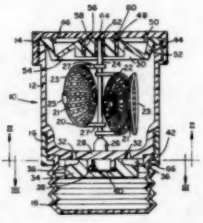
c. means for directing paint cleaning fluid to the rotatably mounted roll in said housing.

4,700,729

LENS CLEANING DEVICE

Arnold Thaler, Plantation, Fla., assignor to Windmere Corporation, Hialeah, Fla.

Filed Nov. 12, 1985, Ser. No. 796,717
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—139 18 Claims



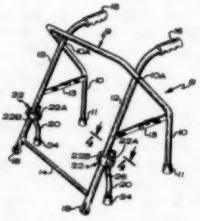
1. A system for cleaning contact lenses comprising: a chamber; irrigation means for generating at least one stream of cleaning fluid within said chamber; lens retaining means for retaining at least one contact lens rotatably disposed within said chamber and exposed to at least a portion of said at least one stream of cleaning fluid at some position of rotation; and said lens retaining means including a spindle means for supporting said lens retaining means, said at least one contact lens being rotatable about said spindle means, said spindle means being held at both ends.

4,700,730

WALKER FOR A SMALL CHILD

John P. Samuelson, Fridley, and Douglas A. Quast, Elk River, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jan. 2, 1986, Ser. No. 815,580
Int. Cl.[4] A61H *3/04*
U.S. Cl. 135—67 5 Claims



1. In a walker of the type having a pair of laterally spaced rear support posts and aligning front support posts joined together to define a lateral space between the sets of support posts, handle means along the lateral sides of the walker and spaced rearwardly from the front of the walker, and wheels on the lower ends of the front support posts so that for operation a patient lifts up on the handle means to cause the rear posts to leave the support surface and the walker to roll forward on the wheels, the improvement comprising:

a pair of auxiliary leg members;

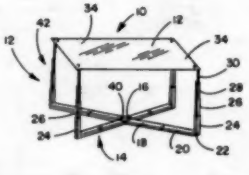
adjustable means for attaching each auxiliary leg member to one front support post positioned to the rear of the wheels so that when the leg members and the rear support posts rest on a support surface the wheels on the front support posts are spaced from the support surface and upon lifting up on the handle means a short distance the wheels engage the support surface and the leg members and rear support posts clear the support surface.

4,700,731

FOLDABLE SHADE STRUCTURE

Michael K. Smith, 3021 Oak Ave., #9, Coconut Grove, Fla. 33133

Filed Dec. 3, 1984, Ser. No. 677,693
Int. Cl.[4] E04H *15/58, 15/46*
U.S. Cl. 135—117 2 Claims



1. A foldable shade structure, comprising:

a generally planar center having four edges and four corners;

four generally U-cross section inner bases, each hingedly coupled at an inner end of each inner base to a different one of the four edges of the center and each inner base generally disposed about an axis;

four outer bases each having a generally U-cross section of slightly smaller size than the inner bases so that the smaller U-cross sections can fit into the larger, each outer base is hingedly coupled at an inner end of said outer base to the outer end of its associated inner base so that when the small base is fitted into the larger, the two bases are interfitted so that the bottom of the inner base covers the open top of the outer base and the bottom of the smaller outer base partially covers the open top of the inner base and when extended each inner base is generally co-axial to its adjacent outer base and when one base is fitted inside the other, the inner base is generally co-axial to the outer base which is disposed partially within the inner base;

four leg bases each hingedly coupled at a lower end to the outer end of a different outer base and each leg base disposed about an axis, each leg base being capable of rotating to an extended position at a 90° angle above the adjacent outer base, and each leg base being capable of rotation 270° from the extended position to fit inside the U-cross section of the outer base which in turn fits inside the U-cross section of the inner base and when so folded is generally co-axial with both the inner base and the outer base so that when the bases are folded, the inner base and outer base form the general cross section of a rectangle with the leg base disposed inside the rectangle;

a plurality of upper leg segments extending from each leg base, each leg comprising the leg base and at least one upper leg segment disposed about an axis co-axial with the leg base and having the same cross section shape of the leg base into which it is coupled, each segment being smaller in cross section than the adjacent cross section close to the inner base and slidably coupling into the adjacent portion of the leg closer to the inner base and slidably being capable of being extended from the next larger portion of the leg;

one spring means coupled between each outer base and leg and exerting force causing the leg to rotate 270° from the interfitted folded position the inner base to an orientation 90° above the axis of the inner base; and

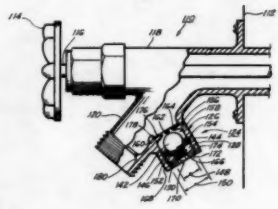
a generally rectangular foldable shade means having four sides and four corners and a surface defining coupling means near each corner capable of removeably coupling to the top of each leg.

4,700,732

FAUCET DRAIN APPARATUS

Robert D. Francisco, 4420 Trails End NE., Oklahoma City, Okla. 73078

Filed Sep. 4, 1986, Ser. No. 903,699
Int. Cl.[4] F16K *24/02*
U.S. Cl. 137—107 **5 Claims**



1. A faucet drain apparatus for protecting a faucet from low temperature effects, the faucet drain apparatus comprising:

a faucet extension member supported by the faucet, the faucet extension member comprising a body portion having a fluid flow bore extending therethrough and a drain bore, the drain bore communicating with the flow bore so that residual water present in the body portion can be drained from the body portion through the drain bore; and

fluid valving means disposed in the drain bore and responsive to flow pressure through the fluid flow bore for sealing the drain bore in the presence of a predetermined flow pressure of fluid in the fluid flow bore and for opening the drain bore when the flow pressure of the fluid in the fluid flow bore drops below the predetermined value, the fluid valving means comprising: a ball closure member disposed within the drain bore;

a valve seat supported in close proximity to a discharge end of the drain bore; and

a spring member disposed within the discharge end of the drain bore for biasing the ball closure member in seating engagement with the valve seat so as to seal the drain bore when the flow pressure of the fluid in the fluid flow bore is above the predetermined value, the spring member biasing the ball closure member away from the valve seat to open the drain bore when the flow pressure of the fluid in the fluid flow bore is below the predetermined value;

ball retainer means for retaining the ball closure member within the drain bore when the spring member biases the ball closure member away from the valve seat, the ball retainer member being disposed within the drain bore so as to be in close proximity to an inlet end of the drain bore, and the ball retainer member permitting fluid flow therethrough for passage around the ball closure member when the ball closure member is biased away from the valve seat; and

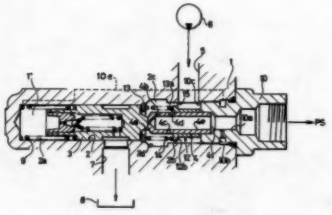
filter means disposed within the inlet end of the drain bore of the faucet extension member for removing particulate materials from fluid passing through the drain bore and for preventing the particulate materials from entering the drain bore, the filter means disposed a distance upstream of the ball retainer means so as to prevent contact of the ball closure member with the filter means when the ball closure member is biased away from the valve seat.

4,700,733

FLOW CONTROL VALVE

Kazuyoshi Uchino, Tsurugashima, and Masaya Nikaido, Higashimatsuyama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1985, Ser. No. 776,556
Claims priority, application Japan, Sep. 25, 1984, 59-199959; Mar. 27, 1985, 60-63001; Apr. 1, 1985, 60-68774; Apr. 1, 1985, 60-68775; Apr. 4, 1985, 60-71650; Apr. 4, 1985, 60-71651
Int. Cl.[4] G05D *7/01*; F16K *31/122*
U.S. Cl. 137—117 **13 Claims**



1. A flow control valve having first and second valve means, means defining a supply path between a hydraulic fluid discharged from a sump via a pump and a hydraulic instrument, an orific formed in said supply path, a pressure differential across said orifice effecting an opening of said first valve means

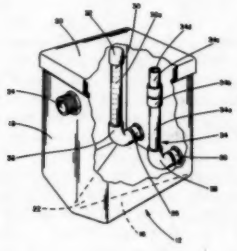
to return part of the hydraulic fluid to said sump, comprising a trunk union disposed in a bore defined in a housing and secured to said housing, said orifice being formed in said union, said second valve means including a sleeve fitted around said union and having fluid restricting means on the external surface thereof for restricting the passage of hydraulic fluid past said fluid restricting means, a pressure differential between the upstream and the downstream side of said restricting means being effective to cause a sliding movement of said sleeve to reduce the area of said orifice, said bore including a portion having an increased diameter to facilitate an increased flow past said fluid restricting means as said sleeve moves into said bore portion as a result of said pressure differential.

4,700,734

WATER COLLECTING AND SPRING BOX AND GAUGING SYSTEM AND HOLDING TANK

Robert G. McCauley, 75 Marr Creek Rd., Bryson City, N.C. 28713

Filed Jul. 22, 1985, Ser. No. 757,464
Int. Cl.[4] E03B *11/02*
U.S. Cl. 137—236.1 **21 Claims**



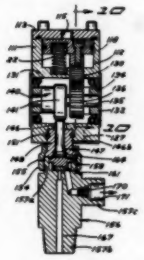
1. A spring box for collecting and gauging water comprising: a box type water holding structure including a bottom, side walls, and a top; a water inlet formed in said box type structure for directing water from a source such as a spring into said box; and supply outlet means for directing a constant flow rate of water from said spring box; an elongated water filter operatively connected to said supply outlet means and extending generally vertically therefrom; a drain outlet formed in the box type water holding structure; an overflow pipe assembly operatively connected to said drain outlet and extending generally vertically therefrom and including a drain opening for receiving water which is directed through said overflow pipe assembly and out said drain outlet; and co-operative control means associated with both said filter and said overflow pipe assembly for co-operatively gauging and varying the flow of water from the spring box, said co-operative control means including co-operative means for varying the height of water maintained in the spring box and for varying the rate of water flow per increment of increase or decrease in the water height from the spring box; said co-operative control means including a series of openings strategically spaced along the water filter for varying the flow of water from the spring box relative to the height of the water maintained in the spring box at any one time and for varying the rate of increase or decrease of flow relative to incremental increases or decreases in the height of the water, and means for vertically adjusting the drain opening on the overflow pipe assembly so as to consequently adjust the level of water normally maintained in the spring box which in turn in co-operation with the strategically spaced openings on the filter is effective to vary the flow rate of water from the spring box.

4,700,735

FLUID ACTUATED VALVE APPARATUS

Edward L. Hamernik, Minneapolis, and Daryll D. Patterson, Brooklyn Park, both of Minn., assignors to Tescom Corporation, Elk River, Minn.

Continuation-in-part of Ser. No. 738,998, May 29, 1985, abandoned. This application Aug. 18, 1986, Ser. No. 897,915
Int. Cl.[4] F16K *31/163*
U.S. Cl. 137—270 **21 Claims**



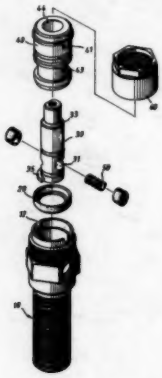
1. For operating a valve between open and closed conditions, a fluid operated actuator that is convertible from functioning in a normally open mode to a normally closed mode, comprising a housing having wall means defining a cylinder first bore and a second bore, said second bore having one end that opens to the ambient atmosphere, a valve operating plunger mounted in the housing for reciprocal movement between a valve open first position and a valve closed second position, a piston in the cylinder bore, a spring acting against said piston to resiliently retain the piston in a first position while permitting the piston to be operated under fluid pressure to a second position permitting the plunger moving to the plunger first position, a rack attached to the piston to move therewith, eccentric lobe means mounted in the housing second bore for removal through the second bore one end and being movable by movement of the rack between a first position abutting against the plunger and retaining the plunger in the plunger second position and a second position permitting the plunger moving to the plunger second position, said eccentric means including a spindle and a spur gear keyed to the spindle and selectively angularly positioned in intermeshing relationship with the rack for, in the valve open mode, piston first position, retaining the lobe means in the lobe means first position, the spindle having one end and a radial first mark on the spindle one end and the housing having a second and a third mark thereon that are adjacent to the second bore and the spindle one end and are in angular spaced relationship that one of the second and the third marks is angularly aligned with the first mark when the spindle is in an angular position in intermeshing relationship with the rack in the valve open mode, first position and that the other of the second and third marks is angularly aligned with the first mark when the spindle is in an angular position in intermeshing relationship with the rack in the rack valve closed mode, piston first position, and a cover removably secured to the housing for selectively closing the second bore open end and permitting removal and reinsertion of the eccentric lobe means into the second bore to convert between a valve open and a valve closed mode.

4,700,736

FAUCET VALVE

Guang-Yue Sheen, No. 5, Lane 215, Yung Ho Street, South District, Taichung, Taiwan

Filed Jan. 5, 1987, Ser. No. 547
Int. Cl.[4] F16K *43/00*
U.S. Cl. 137—315 **1 Claim**



1. An improved faucet valve comprising:

(A) a body having a multiplicity of slots on the top end thereof;

(B) a removable cartridge having a notched circular edge on the upper end thereof, and an external stop of obtuse span on the bottom end thereof;

(C) an insert having a multiplicity of projections on the top end, and a tapered lower end; said projections corresponding to and fitting into said slots on the top end of said body so as to secure the insert and so as to fix the orientation of the insert with respect to the body; said insert having a circular projection which snaps together with said notched circular edge; and

(D) a tapered annular ring; said annular ring fitting in between an insert seat on said body and said insert; the upper inner diametral surface of said annular ring being tapered so as to receive said tapered lower end of said insert; and said annular ring being made of rubber or rubber-like material.

4,700,737

COMBINATION WALL MOUNT, CADDY MOUNT GARDEN HOSE REEL

Terry N. Nelson, Shoreview, Minn., assignor to The Specialty Mfg. Co., St. Paul, Minn.

Filed Aug. 29, 1986, Ser. No. 902,171
Int. Cl.[4] A62C *35/00*; B65H *75/40*
U.S. Cl. 137—355.27 **14 Claims**

1. A combination wall mount and caddy mount for storing a flexible hose on a reel, comprising:

a hose reel support structure for rotatably supporting the reel, including

a yoke, including a yoke base and yoke arms, with the yoke arms operably connected to the reel; and

a generally vertically oriented elongate support member fixedly connected to the yoke base and downwardly depending from the hose reel support structure and having a lower end;

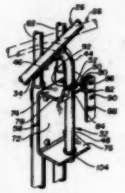
a bracket assembly for selectively removably receiving the support member including

a first support element presenting an upper surface and including structure defining an upper aperture for receiving the support member;

a second support element vertically spaced apart from the first support element a predetermined distance and oriented generally below the first support element and including structure defining a lower aperture for receiving the support member,

such that a generally vertically oriented support axis is defined by the upper and lower apertures; and

height positioning means fixedly connected to the support member at a point above the lower end of the support member not less than the predetermined distance between the upper support element and the lower support element for abutably engaging the upper surface of the first support element and allowing the lower end of the support member to be inserted completely through the upper aperture along the path of travel defined by the support axis and then inserted at least into the lower aperture,



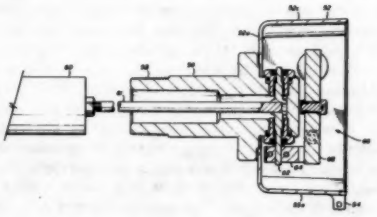
whereby the hose reel support structure may be mounted in the bracket assembly by slidably inserting the lower end of the support member through the upper aperture and toward the lower aperture until the horizontal positioning means vertically positions the support member in the bracket assembly by restraining the support member from continuing downward along a path of travel defined by the support axis, and the hose reel support structure may be removed from the bracket assembly by lifting the hose reel support structure upwardly until the lower end of the support member is above the upper support element.

4,700,738

LIQUID LEVEL CONTROLLER

John J. Frese, Katy, and Quin D. Kroll, Houston, both of Tex., assignors to Dover Resources, Inc., Tulsa, Okla.

Filed Sep. 17, 1986, Ser. No. 908,228
Int. Cl.[4] F16K *31/18*
U.S. Cl. 137—412 **8 Claims**



1. A liquid level controller, comprising

a housing having a rear wall, side walls surrounding the rear wall and a cover connected to the side walls,

a shaft rotationally within said housing in a position parallel to the rear wall of said housing,

a lever pivotally mounted to said housing,

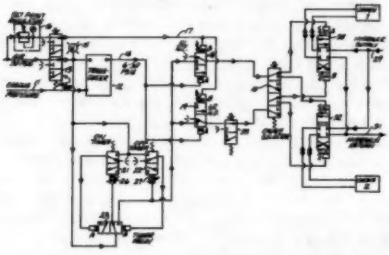
a torque bar pivotally mounted about its approximate mid point,
a liquid displacement member for sensing the liquid level to be controlled,
an arm extending through the rear of said the housing to said liquid displacement member for transmitting vertical forces responsive to changes in liquid level as a force tending to rotate said shaft,
means for transmitting force exerted on said shaft to a force on said torque bar about its pivotal mounting,
means interconnecting said torque bar and said lever for transmitting forces to said lever,
means biasing said bar to balance force exerted thereon by the weight of the liquid displacement member,
a valving assembly,
means engaging between said lever and said valving assembly to provide an output for controlling liquid level, and
means for varying the sensitivity of means providing the output for controlling liquid level.

4,700,739

PNEUMATIC WELL CASING PRESSURE REGULATING SYSTEM

Mark C. Flohr, Irvine, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 14, 1985, Ser. No. 798,634
Int. Cl.[4] E21B *34/08*
U.S. Cl. 137—488 **17 Claims**



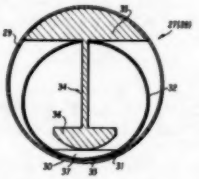
1. A pneumatic well casing pressure regulating system comprising:
a hydraulically actuated choke for relieving well casing pressure;
a continually running source of pneumatic pressure pulses;
first means for applying pulses of hydraulic fluid corresponding to the pneumatic pressure pulses to the choke for opening the choke one step for each pulse of hydraulic fluid when actual casing pressure is higher than a desired casing pressure; and
second means for applying pulses of hydraulic fluid corresponding to the pneumatic pressure pulses to the choke for closing the choke one step for each pulse of hydraulic fluid when actual casing pressure is less than a desired casing pressure.

4,700,740

DISCHARGE VALVE

Takashi Mitsumoto, Kassel; Dankwart Eiermann, Weisseasberg, and Roland Nuber, Lindau, all of Fed. Rep. of Germany, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan and Firma Wankel GmbH, Lindau, Fed. Rep. of Germany

Filed Apr. 25, 1986, Ser. No. 855,708
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515239
Int. Cl.[4] F16K *15/14*
U.S. Cl. 137—512.15 **6 Claims**



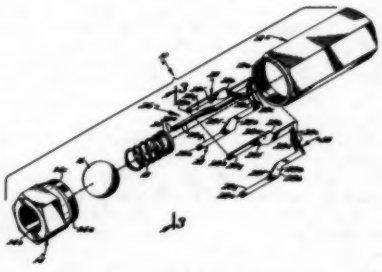
1. A discharge valve, comprising:
a housing provided with a plurality of discharge holes;
a plurality of seat portions formed on an inner circumferential face of said housing and a portion surrounding said discharge holes;
a valve member disposed within said housing and provided with a plurality of valve portions;
a valve support member disposed within said housing for supporting said valve member; and
projecting means provided between said discharge holes and said inner circumferential face of said housing and projected between said valve portions, said projecting means having a relatively narrow, tapered free end portion.

4,700,741

BALL CHECK VALVE

Edward P. Murphy, Coon Rapids, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Sep. 8, 1986, Ser. No. 905,242
Int. Cl.[4] F16K *15/04*
U.S. Cl. 137—543.19 **5 Claims**



1. A ball check valve having a linear flow axis and comprising:
a first housing member;
a second housing member releasably attached to said first housing member;
a ball having a diameter;
a seat in said first housing member for releasably receiving said ball;
a spring having a diameter;
a ball retainer in said first housing, said retainer comprising:

a first inside diameter somewhat greater than said ball diameter for releasably receiving said ball;

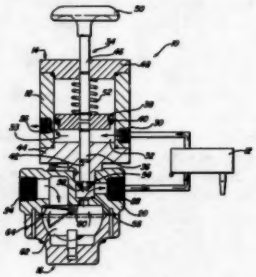
a second inside diameter less than said ball diameter and greater than said spring diameter, said retainer being formed of at least three substantially identical retainer components, each said component being generally u-shaped, formed from a generally planar piece of material and comprising a base, two leg portions and an included angle being formed by a fold in said base parallel to said leg portions and said flow axis, said included angle being such that the sum of the included angles of said components is about 360°, on of said leg portions of one of said components being in substantial planar contact with a leg portion of an adjacent said component.

4,700,742

AUTOMATIC SHUT-OFF DEVICE

Lars O. Rossen, 1755 E. Nine Mile Rd., Hazel Park, Mich. 48030

Filed Sep. 29, 1986, Ser. No. 912,046
Int. Cl.[4] F16K *37/00*
U.S. Cl. 137—557 **9 Claims**



1. An automatic shut-off device for detecting a fluid flow fault associated with a remote fluid system and interrupting fluid flow to the remote system in response to the flow fault, said shut-off device comprising:

a fault detection assembly having a housing portion, an inlet port, an outlet port, and a fluid passageway all formed in said housing portion and said fluid passageway fluidly connecting said inlet port to said outlet port,

said fault detection assembly further comprising a fluid responsive means disposed within said fluid passageway and axially movable in response to changes in fluid flow through said fluid passageway,

means fluidly connecting said remote system to said inlet port,

a flow indicator assembly having a housing portion, an inlet port, an outlet port and a fluid passageway all formed in said housing portion and said fluid passageway fluidly connecting said inlet port and said outlet port,

said flow indicator assembly further comprising second fluid responsive means disposed within said fluid passageway of said indicator assembly such that it is directly responsive to fluid flow, and operable to visually indicate exteriorly of said housing portion the flow rate of fluid flowing through said fluid passageway,

means fluidly connecting said remote system to said outlet port of said flow indicator assembly whereby fluid normally flows through said outlet port of said flow indicator assembly, through said remote system and to said inlet port of said fault detection assembly, and

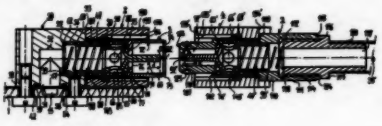
valve means disposed within said fluid passageway of said fluid indicator assembly and operably connected with said fluid responsive means of said fault detector assembly to move to a position closing fluid flow to said fluid indicator assembly outlet and thus to said remote system upon fluid pressure in said fluid passageway of said fault detection assembly falling below a predetermined value to thereby shut down fluid flow through said remote system.

4,700,743

MINIATURE FLUIDIC CONNECTOR

Patrick L'Henaff, Colomiers, and Herve Bricaud, Toulouse, both of France, assignors to Amphenol Corporation, Wallingford, Conn.

Filed Mar. 11, 1986, Ser. No. 838,508
Claims priority, application France, Mar. 18, 1985, 85 03969
Int. Cl.[4] F16L *37/28*
U.S. Cl. 137—560 **6 Claims**



1. A miniature fluidic connector mountable in an electrical connector of the type comprising a plug and a receptacle, each provided with openings, said electrical connector being adapted to be mounted to a printed circuit board having a built-in heat exchanger comprising a drain having a network of channels for the circulation of a heat-carrying fluid, said fluidic connector comprising a male fluidic contact and a female fluidic contact, said male fluidic contact comprising a contact body having an inner chamber permitting the passage of said heat-carrying fluid and being embedded in an opening of one of said plug and said receptacle of said electrical connector of a standard size normally receiving an electrical contact, said male contact body being prolonged on one side by a male tip, and the female fluidic contact comprising a contact body having an inner chamber permitting the passage of said heat-carrying fluid and being embedded in an opening in the other element of said electrical connector also of a standard size normally receiving an electrical contact, said female contact body being prolonged on one side by a female tip shaped to receive said male tip, at least one of said male tip and said femal tip projecting in part relative to the end of its respective opening so that, when coupled, the ends of the openings of said plug and of said receptacle of said electrical connector will be substantially pressed against one another, said inner chambers of said male contact body and said female contact body each having mounted therein a self-plugging device comprising a valve, an elastic device urging said valve into a closed position to prevent the passage of said fluid, a means which, during said coupling, brings said valve into an open position to permit the passage of said fluid through said contact bodies, and an internal sealing device which, in a closed position, prevents the passage of said fluid out of said contact bodies towards the respective tip, said valves further comprising a skirt slidable in said inner chamber of said contact body and receiving said elastic device, said skirt being prolonged by a part of smaller diameter to permit the passage of said fluid between an inner recess of said skirt and said inner chamber of said contact body, the said part terminating in a closure cone,

said electrical connector comprising an insulating body having said standard size opening and a second opening disposed at a right angle to said standard sized opening and being adapted for communication with said network of channels in said board, one of said male and female fluidic contacts being mounted in one of said standard size openings such that its inner chamber is in communication with said second opening of said electrical connector, whereby said fluid is flowable through said one fluidic

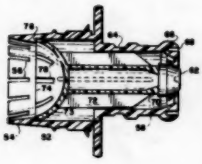
contact, through said second opening and into said network of channels in said board.

4,700,744

DOUBLE SHUT-OFF FLUID DISPENSER ELEMENT

Christopher C. Rutter, and Peter N. Thomsen, both of 21063 Cabot Blvd., Hayward, Calif. 94545

Filed Mar. 10, 1986, Ser. No. 837,776
Int. Cl.[4] F16L *29/00*
U.S. Cl. 137—614.04 5 Claims



1. An improved valved element for interconnection between a tubular fitment sealed around an opening in a fluid container and extending from the exterior surface of the container, and a valved fluid dispensing member having a normally closed valve having an axially movable spring biased valve opening member, said improved valved element comprising:

a resilient housing having first and second tubular ends, said first tubular end being sealable within the tubular fitment said second end being closed with an axial valve seat opened toward said valved fluid dispensing member;

an annular resilient ring formed around the second end of said resilient housing for sealing said housing to said dispensing member, said ring formed in said resilient housing and overlying an annular groove formed in the second end of said housing;

a tubular extension skirt on said first tubular end, said skirt extendable through the fluid container opening into the fluid container, said skirt having openings for the passage of fluid therethrough; and

elongated valve means axially movable within said resilient tubular housing and having a valve member at a second end and positioned to be axially moved into and from said valve seat by the spring biased valve opening member in said valved fluid dispensing member, said elongated valve means having a first end resiliently coupled to the interior surface of the first tubular end of said resilient housing, said elongated valve means remaining axially centered within said tubular housing by at least three longitudinally elongated fins radially extending from said valve means.

4,700,745

VALVE

Darwin L. Ellis, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 29, 1985, Ser. No. 792,500
Int. Cl.[4] F16K *11/02*
U.S. Cl. 137—625.11 9 Claims

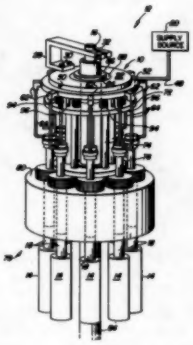
1. A valve for distributing pressurized fluid from a stationary supply source to a plurality of rotatable screwcapping heads, said screwcapping heads being arranged radially about a rotatable shaft, said valve comprising:

(a) a stationary member axially aligned with said rotatable shaft and having a first surface with first and second arcs formed therein, both arcs having an equal radius, an inlet passage connecting said supply source to said first arc and an outlet passage connecting said second arc to the atmosphere;

(b) a support member securely fixed to said rotatable shaft;

(c) a rotational member axially aligned with said rotatable shaft and being rotatably secured to said support member, said rotational member having a first surface in contact with said first surface of said stationary member, said first surface having at least two slots formed therein which are arranged on a predetermined radius, said predetermined radius being equal to the radius of said first and second arcs, and at least two radial passages fluidly connecting each of said slots to one of said screwcapping heads; and

(d) biasing means for urging said rotatable member into



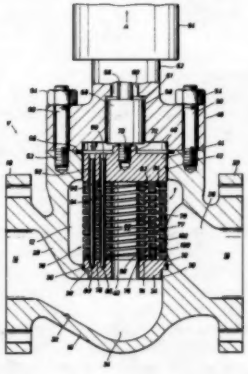
constant contact with said stationary member, said biasing means located between said support member and said rotational member for assuring that pressurized fluid from said supply source can be routed through said first arc and at least one of said slots to at least one of said screwcapping heads and exhaust fluid from at least one of said screwcapping heads can be vented through at least one of said slots and said second arc to the atmosphere.

4,700,746

CONTROL VALVE FOR HIGH PRESSURE FLUIDS

Gayle E. Barb, Houston, Tex., assignor to Anchor/Darling Valve Company, Williamsport, Pa.

Filed Mar. 13, 1985, Ser. No. 711,585
Int. Cl.[4] F16K *1/36, 47/02*
U.S. Cl. 137—625.28 8 Claims



1. A control valve comprising:

a valve body, said valve body including an internal cavity, a

fluid inlet and at least one fluid outlet, said outlet being in open communication with said cavity;

a plurality of helical springs arranged one within the other and disposed in said cavity, the convolutions of the innermost of said spring defining a fluid media pathway in open communication with said inlet, said springs being disposed such that fluid flowing through said valve from said inlet to said outlet must flow through at least some of the convolutions of each of said springs in series; and

means operable externally of said body for selectively effecting axial movement of the convolutions of at least one of said springs to thereby vary the axial spacing between the convolutions of said springs and thereby control the fluid flow from said pathway through the spaces between said convolutions into said cavity.

4,700,747

PROPORTIONAL HYDRAULIC DISTRIBUTOR

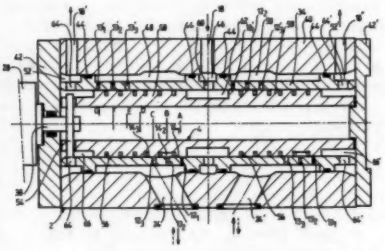
Claude Wartelle, Gouvieux, France, assignor to Centre Techniques des Industries Mecaniques, Senlis Cedex, France

Filed Jul. 15, 1985, Ser. No. 755,280

Claims priority, application France, Jul. 20, 1984, 84 11508

Int. Cl.[4] F16K *11/07, 11/085*

U.S. Cl. 137—625.23 **10 Claims**



1. A proportional hydraulic distributor comprising a first and a second member, one of which is a fixed body and the other of which is a movable distributor member having a cylindrical surface in contact with a corresponding cylindrical surface of the fixed body, the first member possessing at least one hydraulic-fluid passage opening onto its surface, the second member possessing on its surface at least one zone shutting off the said passage and at least one recess forming a zone exposing the said orifice, and the said movable member being controlled by an actuating system, the said distributor being one in which at least one of the abovementioned passages consists of a plurality n of elementary orifices, or nozzles, which are pierced in the first member and are at a distance from one another and the total cross-section of which forms the cross-section of the said passage, in which the said nozzles are arranged on a plurality of parallel tracks directed parallel to the relative movement of the two members, each track possessing at least one nozzle, and the cross-section of the nozzles increases in the ratio a, 2*a*, 4*a*, 8*a*, and so on, from one track to the other, and the extension of the recesses and of the shut-off zones on the corresponding tracks of the second member is in the ratio d, 2*d*, 4*d*, 8*d*, and so on, in which the said actuating system is a step-by-step system driving the movable member in increments of value d, and in which the recesses and the shut-off zones provided on the second member are such that the said nozzles are exposed or shut off in turn at each advance of the movable member by one increment d.

4,700,748

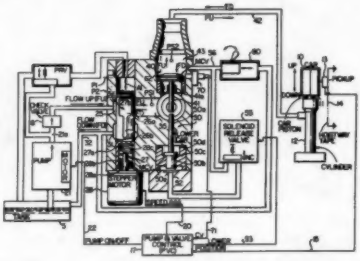
PRESSURE-REFERENCED PROGRAMMED FLOW CONTROL IN A HYDRAULIC VALVE

Giorgio Fossati, Monza; Harold Terry, Vedano Al Lambro, and Giuseppe Manco, Agrate Brianza, all of Italy, assignors to Otis Elevator Company, Farmington, Conn.

Continuation-in-part of Ser. No. 799,665, Nov. 18, 1985, abandoned. This application Apr. 17, 1986, Ser. No. 853,284

Int. Cl.[4] F15B *13/044*

U.S. Cl. 137—877 **5 Claims**



1. A hydraulic valve comprising:

a main inlet adapted for connection to a pump;

a main outlet adapted for connection to an actuator comprising a piston and a cylinder;

a secondary outlet adapted for connection to a fluid tank;

a flow control valve for controlling fluid flow from the main inlet to the main outlet;

the hydraulic valve being characterized by:

a check valve with its inlet connected to the flow control valve and its outlet connected to the main outlet, the check valve being operable to open and connect its inlet and outlet when the pressure in the inlet exceeds the pressure in the outlet and also being mechanically operable to open;

a switch that is actuated by the motion of the check valve when the check valve opens and closes;

the flow control valve being continuously movable between two positions to control from a minimum to a maximum equaling the pump output to flow between the main inlet and the main outlet through the check valve and discharge from the main outlet to the tank;

a hydraulic actuator that opens the check valve by applying a first force to open the check valve slightly to allow the pressure to equalize on each side of the check valve and by subsequently applying a lower second force to additionally open the check valve;

a solenoid valve operable for applying fluid under pressure to move the hydraulic actuator to said first and second positions.

4,700,749

SWIRL-GENERATING, HELICAL AGITATOR FOR HEAT EXCHANGER TUBES

Patrick Cadars, Maurepas, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Continuation of Ser. No. 652,986, Sep. 21, 1984, abandoned, which is a continuation of Ser. No. 284,316, Jul. 17, 1981, abandoned, which is a continuation of Ser. No. 92,828, Nov. 9, 1979, abandoned. This application Sep. 23, 1986, Ser. No. 910,811

Claims priority, application France, Nov. 24, 1978, 78 33240

Int. Cl.[4] F15D *1/02*

U.S. Cl. 138—38 **9 Claims**

1. A swirl-generating, helical agitator for use in combination with a heat exchanger tube, said agitator comprising:

(a) a strip of material twisted into a helix to be received by said tube,

(b) the cross-section of said strip consisting of an S-shaped central portion including opposed double inflections and two lateral portions inclined with respect to and on either side of said central portion with each lateral portion connected to an outer end of the central portion to form a symmetrical angular structure defining an angle of inclination between each lateral portion and the central portion,

(c) said lateral portions have a length greater than the length of the central portion and extend in opposed directions outwardly from the central portion.

4,700,750

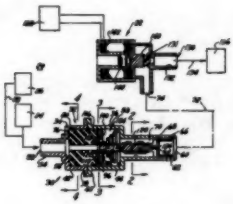
HYDROCARBON FLOW RATE REGULATOR

John E. Cook, Chatham, Canada, assignor to Bendix Engine Components Limited, Chatham, Canada

Filed Oct. 31, 1985, Ser. No. 793,380

Int. Cl.[4] E15D *1/02*

U.S. Cl. 138—46 **18 Claims**



13. A flow regulator or sensor for restricting the flow of vapors therethrough in accordance with the concentration of hydrocarbons in the vapor comprising

hydrocarbon sensitive material capable of expanding and contracting in accordance with the concentration of hydrocarbons in said vapor communicated thereto, said material including at least one flow passage through which said vapor may flow;

a control orifice in communication with said one flow passage;

piston means, movable with said material including an end cooperating with said control orifice to regulate the flow area through said control orifice in proportion to the movement of said material.

4,700,751

INSULATED PIPE APPARATUS

Ronald M. Fedrick, 3600 Fedrick Ranch Rd., Petaluma, Calif. 94952

Continuation-in-part of Ser. No. 667,226, Nov. 1, 1984. This application Jul. 29, 1986, Ser. No. 891,546

Int. Cl.[4] F16L *9/14*

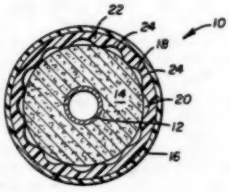
U.S. Cl. 138—149 **8 Claims**

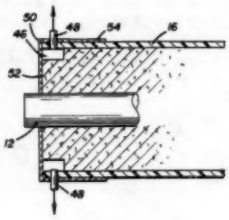
1. An insulated pipe apparatus, comprising:

an inner conduit for carrying fluids;

insulating material surrounding said inner conduit and extending substantially the length of said inner conduit, said insulating material being a circumferentially and longitudinally continuous sleeve along the length of said inner conduit;

a rigid outer casing of a material resistant to mechanical stress and moisture ingress, coaxial and coextensive with said inner conduit and surrounding said insulating material;





means defining a plurality of longitudinal elongated voids between said outer casing and said insulating material, said elongated voids being of substantially constant cross-section and coextensive with said insulating material;

including interconnecting means for interconnecting said elongated voids and for sealing the ends of said insulated pipe apparatus between the outer surface of said inner conduit and said rigid outer casing, and coupling means for connecting said elongated voids to external equipment.

4,700,752

CLOCK SPRING CRACK ARRESTOR

Norman C. Fawley, 5701 Seaside Walk, Long Beach, Calif. 90803

Continuation-in-part of Ser. No. 633,684, Jul. 25, 1984, Pat. No. 4,559,974, which is a continuation of Ser. No. 432,321, Oct. 1, 1982, abandoned. This application Dec. 23, 1985, Ser. No. 812,726

Int. Cl.[4] F16L *9/14*

U.S. Cl. 138—172 **19 Claims**

1. Apparatus for arresting a propagating ductile fracture in a pipe containing fluid under a presssure sufficient to subject the pipe to the possibility of a ductile fracture propagating at a high speed in a predetermined direction, comprising:

means for stopping the propagating ductile fracture, said stopping means comprising a band of high tensile strength material defining a clock spring spiral terminating in an inner end and an outer end and having a plurality of elastic convolutions for encircling and engaging the pipe, each convolution having an inner surface and an outer surface in contract with corresponding surfaces of adjacent con-

volutions, said high tensile strength material comprising a plurality of continuous, high tensile strength filaments

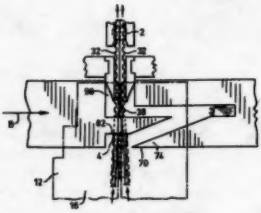
encapsulated in a resin matrix and extending through said clock spring spiral parallel to the direction of spirtal.

4,700,753

ELECTRONIC COMPONENT SPACER MECHANISM

Franciscus J. A. Storimans, Gormley, Canada, assignor to GPD Canada Inc., Gormley, Canada

Filed Aug. 22, 1986, Ser. No. 899,310
Int. Cl.[4] B21F *23/00*
U.S. Cl. 140—147 **13 Claims**



1. A spacer for spacing the leading component of a single file column of electronic components from the following component as the components are advanced by a feeder along a path which extends to a pick-off point of a component handling machine, each electronic component having a body portion and lead wire means projecting from the body portion below the feeder, said spacer comprising;

(a) a shuttle mounted below and located adjacent said feeder for reciprocating movement across said path between a first position and a second position, said shuttle having an upstream end and a downstream end spaced from the advancing column of components,

(b) a first stop on said shuttle arranged to extend across said path to stop the advance of said next following component at a first point as said shuttle moves from its first position to its second position and back to its first position,

(c) a second stop on said shuttle arranged to extend across said path when said shuttle is in said first position, to stop the advance of said leading component at a second point which is located downstream of said first point,

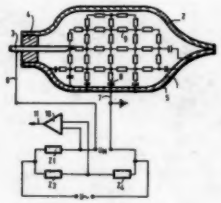
(d) a passage opening through said shuttle to permit passage of the leading component from said first point to said pick-off point, said passage having a first angularly inclined face arranged to engage the lead wire means of a leading component located at said second point as said shuttle moves from its first position to its second position to advance said leading component from said second point to said pick-off point to space it from the next following component.

4,700,754

ARRANGEMENT FOR CONTROLLING THE LEVEL OF AN INK CONTAINER

Horst Kringe, Netphen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1986, Ser. No. 880,397
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3524250
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—95 **4 Claims**



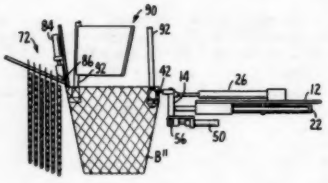
1. An arrangement for indicating the refilling level of a collapsible ink container comprising a measuring circuit having an alternating voltage source said circuit producing an electric control signal which depends on the capacitance between the liquid ink and an electrically conductive coating which is insulated with respect to the ink by the wall of the ink container, wherein the ink container comprises a lower part (1) and a flexible collapsible upper part (2) and that the electrically conductive coating (5) is provided on the outside of the lower part (1).

4,700,755

MESH BAG OPENER AND BAG FILLING SYSTEM

Algis R. Banys, Reno, Nev., assignor to Filper Corporation, Reno, Nev.

Filed Dec. 30, 1985, Ser. No. 814,856
Int. Cl.[4] B65B *1/00*
U.S. Cl. 141—114 **11 Claims**



9. An apparatus for opening a suspended bag having a pair of mesh faces, said apparatus comprising:

means for vertically suspending the bag;

a carriage;

means for reciprocating the carriage along a substantially horizontal path between an extended position proximate the means for suspending and a retracted position spaced-apart a preselected distance from the means for suspending;

a pair of substantially horizontal spaced-apart pins pivotally mounted on said carriage; and

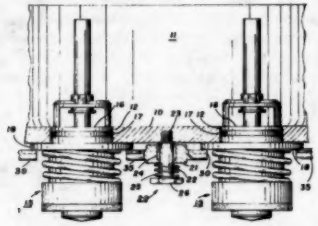
means for pivoting said pins toward and away from each other, whereby said pins will penetrate the bag when said carriage is extended and will engage one face of the bag as the pins are pivoted and the carriage retracted.

4,700,756

RELEASABLE RETAINING MEANS FOR FILLING MACHINE VALVES

Everett S. Minard, Sacramento, Calif., assignor to Elmar Industries, Inc., Santa Clara, Calif.

Filed Sep. 18, 1986, Ser. No. 908,806
Int. Cl.[4] B65B *43/42;* B67C *3/26*
U.S. Cl. 141—144 9 Claims



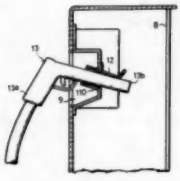
1. In a container filling machine comprising
a cylindrical reservoir provided at its bottom with a plurality of discharge openings disposed in a circular array equidistantly from the center of said reservoir and
a nozzle removably fitted within each of said openings;
the improvement comprising
a cylindrical flange on each of said nozzles, positioned to lie against the underside of said reservoir bottom when the nozzle is fitted within one of said discharge openings, and
a series of clamping means secured to the bottom of said reservoir in a circular array equidistantly between said cylindrical flanges and operable to simultaneously engage the two adjacent flanges to hold their nozzles in position in said openings, or to simultaneously release said flanges.

4,700,757

SUPPORTING STRUCTURE FOR FUEL FEEDING GUN IN FUEL TANK

Takumi Kudo, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Aug. 6, 1986, Ser. No. 893,938
Claims priority, application Japan, Aug. 10, 1985, 60-123431[U]
Int. Cl.[4] B65B *3/24;* B67C *3/34*
U.S. Cl. 141—311 R 4 Claims



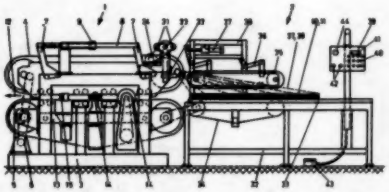
1. A vehicle fuel tank having at least one wall formed by a substantially vertical exterior frame member of the vehicle, said vehicle frame member having an exterior surface, an interior surface, and means defining a laterally facing fuel-receiving aperture therethrough, and a fuel-feeding gun barrel supporting structure on said frame member adjacent to said fuel-receiving aperture, said supporting structure comprising
a short-length cylindrical barrel retainer having an outer end and a base end attached to said frame member exterior surface in surrounding relation with said fuel-receiving aperture, said retainer projecting laterally in the exterior direction whereby its said cylindrical shape defines an upper portion and a lower portion thereof; and
a short-length support member attached to said frame member interior surface adjacent to said fuel-receiving aperture in substantial alignment with said upper portion of said retainer and projecting inwardly of said tank to define an inner end of said support member whereby, when an elongated fuel-feeding gun barrel is inserted into said tank through said fuel-receiving aperture, said barrel is supported and retained by and between said support member inner end and said retainer outer end adjacent to said retainer lower portion.

4,700,758

DEVICE FOR TRIMMING THE EDGES OF VENEER

Oskar Bernath, Umikon, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Switzerland

Filed May 13, 1986, Ser. No. 862,679
Claims priority, application Switzerland, May 14, 1985, 2056/85
Int. Cl.[4] B27C *1/00*
U.S. Cl. 144—118 10 Claims



1. Device for the parallel trimming of the opposite sides of veneer sheets or stacks of veneer sheets comprising means for passing the veneer in a first direction, a pair of tool carriages disposed opposite one another and movably displaceable transversely of the first direction toward and away from one another, tools for cutting the edges of the veneer mounted on said tool carriage and movable therewith, an inlet table spaced upstream in the first direction from said tool carriages, means for optically checking the edges of the veneer extending in the first direction and located on said inlet table and determining the width or dimension transversely of the first direction to which the veneer is to be cut, wherein the improvement comprises means for movably supporting said optical checking means separately from said tool carriages so that said optical checking means can be moved transversely of the first direction, and control means connected to said optical checking means and to said tool carriages so that the width of the veneer to be cut as determined by said optical checking means can be used for movably displacing said tool carriages and tools into position for cutting the determined width of the veneer.

4,700,759

WOOD SPLITTER

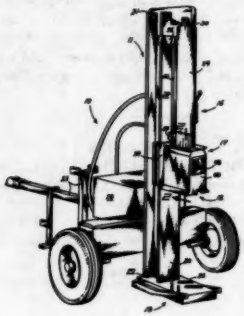
Dennis Duerr, Rte. 1, Box 144, E. 12122 Day Mount Spokane Rd., Mead, Wash. 99021

Filed Apr. 2, 1986, Ser. No. 847,203
Int. Cl.[4] B27L *7/00*
U.S. Cl. 144—193 A 21 Claims

1. A wood splitter for splitting wood blocks, comprising:
a frame;
a platform member on the frame for engaging a wood block at one end thereof;
a splitting blade member on the frame having a blade edge for engaging a wood block at an end thereof opposite the one end;
drive means for moving one of the members toward the

other to split a wood block and for moving the one member away from the other to leave a block receiving space therebetween;

a hollow housing means for receiving and releasably encasing the splitting blade member during movement thereof



relative to the platform toward and away from engagement with a wood block; and

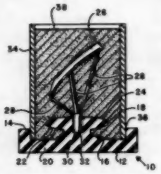
stripping means on the housing means operatively communicating with the frame for stripping the wood block from the blade member as the one member is moved away from the other.

4,700,760

INVESTMENT CASTING MOLD BASE

Joseph L. Weingarten, 1927 Oak Tree Dr. E.,, Dayton, Ohio 45440

Filed May 7, 1981, Ser. No. 261,360
Int. Cl.[4] B22C *7/02, 9/04*
U.S. Cl. 164—244 **1 Claim**



1. A flexible base for use with a cylindrical casting flask for making an investment casting mold to be used in centrifugal casting of articles from molten metal, comprising:

(a) a generally circular base plate:

(b) an upstanding annular flange integrally connected with and extending about the periphery of said base plate and adapted to fit tightly about a lower end of said casting flask;

(c) a generally frusto conical-shaped body integrally connected with and extending upwardly from a central portion of said base plate for forming a funnel cavity in the mold in which to receive an outlet of a molten metal crucible during centrifugal casting of articles in the mold; and

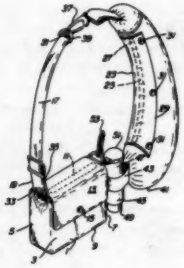
(d) a generally enlarged ellipsoidal-shaped body integrally connected with an upper end of said frusto conical-shaped body, said enlarged body overlying and extending laterally beyond said frusto conical-shaped body so as to also overlie, but be spaced above, said base plate between said flange and said frusto conical-shaped body, said enlarged body having defined therein a cylindrical depression for mounting a part for forming all sprue channels in the mold in alignment with said funnel cavity formed by said frusto conical-shaped body, the portion of said enlarged body extending laterally beyond said frusto conical-shaped body being provided for forming a molten metal staging cavity in the mold which is located outside the direct path of movement of the molten metal to the sprue channels in the mold from the outlet of the crucible when received in said funnel cavity formed by said frusto conical-shaped body of said base, said upper end of said frusto conical-shaped body at its connection to said enlarged body being substantially smaller in diameter than the lateral diameter of said enlarged body so as to provide an opening in the mold between said funnel and molten metal staging cavities thereof of a reduced size which minimizes the potential heat loss from molten metal in said staging cavity.

4,700,761

SWAG BAG

Samuel Gladding, R.D. #4, Box 281, Montrose, Pa. 18801

Filed Jul. 24, 1986, Ser. No. 888,876
Int. Cl.[4] A45C *3/00, 13/26*
U.S. Cl. 150—111 **1 Claim**



1. A swag-bag comprising:

(a) a first bag unit having a top opening and means for opening and closing said top opening;

(b) an adjustable length shoulder strap, having a first and second end, said first end fastened to said first bag unit at a forward sidewall portion, said shoulder strap of sufficient length to position said first bag unit at a person's side beneath an arm and to extend diagonally upwardly across said person's front to position said second end adjacent a shoulder opposite said arm; and

(c) an elongated second bag unit extending between said second end of said shoulder strap and a rearward sidewall portion of said first bag unit; means for removably connecting one end of said second bag unit to said second end of said shoulder strap and another end of said second bag to said first bag unit at a rearward sidewall portion; and means for opening and closing said second bag unit.

4,700,762

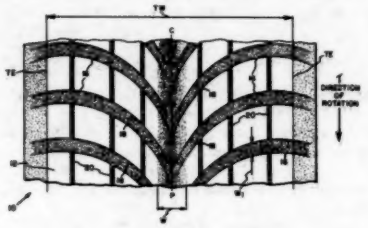
PNEUMATIC TIRE THERAD WITH WIDE CENTRAL GROOVE AND ARCUATE GROOVES

Samuel P. Landers, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 715,056, Mar. 22, 1985, abandoned, which is a continuation of Ser. No. 571,755, Jan. 18, 1984, abandoned. This application Apr. 4, 1986, Ser. No. 848,347
Int. Cl.[4] B60C *11/03*
U.S. Cl. 152—209 R **11 Claims**

1. A tire comprising a carcass of reinforcement material having cords oriented at an angle from about 75° to 90° with respect to the mid-circumferential centerplane of the tire and a ground engaging tread portion extending circumferentially

about said carcass reinforcement material, the interior surface of the crown portion of said tire being continuously concave when viewed from the axis of rotation of the tire, said tread portion having a substantially straight depression therein that extends circumferentially about the tire such that a centerline of the depression does not vary a distance of more than five percent of the effective tread width from the mid-circumferential centerplane of the tire, said depression having a contact width equal to or greater than ten percent of the contact width of said tread portion as measured from a footprint of the tire, a plurality of substantially axially extending grooves extending axially outwardly from each side of said depression to the respective tread edges, each axially extending groove being oriented such that it forms an angle of approximately forty-five



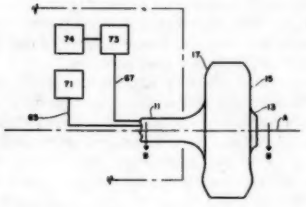
degrees or greater at the point where it merges with the depression and increases in a substantially continuous manner so as to be substantially perpendicular as it reaches the tread edge, a sufficient number of axially extending grooves are provided so that at least three grooves on each side of said depression are in a footprint of the tire, said tread portion having a net to gross ratio in the range of 50 to 65, said tread portion having a tread width equal to or greater than approximately ninety percent of the maximum section width of the tire, said tread portion having a radius equal to or greater than the circumferential radius of the tire as measured at the mid-circumferential centerplane of the tire, said tire having as aspect ratio of not greater than 0.60, and said depression and axially extending grooves having depths equal to or less than 0.2 inches.

4,700,763

REMOTELY CONTROLLED AIRCRAFT TIRE INFLATION/DEFLATION VALVE

Donald E. Williams, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 594,615, Mar. 29, 1984, abandoned.
This application Oct. 4, 1985, Ser. No. 784,128
Int. Cl.[4] B60C *23/10, 29/00*
U.S. Cl. 152—417 **2 Claims**



1. A valve system for remotely controlling, by selective inflation and deflation, the air pressure within a pneumatic tire of a wheel mounted for rotation on an axle of a vehicle, comprising:

a. housing means on said vehicle defining within said axle a substantially cylindrically shaped cavity adjacent said wheel and coaxial therewith;

b. an inner manifold housing within said cavity and mounted to said wheel for rotation therewith, said inner manifold housing having an inlet and an outlet;

c. means defining a pneumatic conduit operatively interconnecting said outlet of said inner manifold housing with said tire for conducting pressurized air between said inner manifold housing and said tire;

d. a poppet valve within said inner manifold housing and mounted for rotation therewith and axially moveable therein between open and closed positions, and spring means resiliently interconnecting said poppet valve and said inner manifold housing for urging said poppet valve axially against said inner manifold housing inlet to said closed position;

e. means on said poppet valve and near said inner manifold inlet defining a non-rotating seal between said poppet valve and said inner manifold housing in said closed position for selectively sealing said inlet of said inner manifold housing whereby pressurized air is selectively conducted between said manifold inlet and said tire in response to axial movement of said poppet valve;

f. a solenoid mounted within said cavity axially adjacent said poppet valve and coaxial with said inner manifold housing and said poppet valve, said solenoid including a plunger in axially alignment with the inner manifold housing and axially moveable between retracted and extended positions, said plunger has an axial hole receiving a shaft which is operatively connected to another shaft operatively connected to said poppet valve for axial and rotational movement therewith, said retracted position and said extended position corresponding respectively to said closed position and said open position of said poppet valve;

g. control means, remote of said tire, for selectively moving said plunger said retracted position and said extended position and thereby selectively closing and opening said poppet valve to selectively inflate and deflate said tire;

h. a source of pressurized air; and

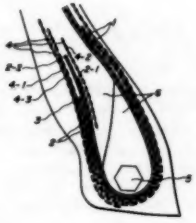
i. conduit means interconnecting said source and said inner manifold housing inlet for selectively conducting pressurized air to said inner manifold housing.

4,700,764

HEAVY DUTY PNEUMATIC RADIAL TIRES

Kazuyuki Endo, Kokubunji; Motoaki Taniguchi, Higashiyamato; Masanobu Takahashi, Iruma; Shigeki Yamada, Nishitama, and Kenshiro Kato, Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 826,159
Claims priority, application Japan, Feb. 5, 1985, 60-19187
Int. Cl.[4] B60C *9/20, 9/08, 15/06*
U.S. Cl. 152—526 **5 Claims**



1. In a heavy duty pneumatic radial tire with an improved service durability of the bead portion comprising a toroidal carcass composed of at least one cord ply containing aromatic

polyamide fiber cords arranged parallel with each other in a direction substantially perpendicular to the equatorial plane of the tire and wound around a bead core from the inside of the tire toward the outside thereof to form a turnup portion, a belt superimposed about a crown region of the carcass and composed of at least three cord layers, a bead portion reinforcement consisting of a stiffener disposed between the carcass and its turnup portion and composed of a base portion of relatively hard rubber stock contacting with the bead core and a thickness-reducing portion of a relatively soft rubber stock integrally united with the base portion, a main chafer extending from a level lower than an upper end of the turnup portion along the turnup region of the carcass toward the inside of the tire and made from aromatic polyamide fiber cords, a plural layer auxiliary chafer made from cords having a modulus of elasticity lower than that of the main chafer and extending radially inwardly downward from a radially outward level higher than the upper end of the turnup portion so as to overlappedly cover the upper end thereof and one end of the main chafer, said auxiliary chafer composed of at least two cord layers covering the outside of said main chafer, among which at least one cord layer being an outer cord layer wound along the turnup region toward the inside of the tire, and at least one cord layer arranged along the axial inside of the turnup portion as an inner cord layer and the auxiliary chafer has a triangular truss structure using a nodal point between the cord layers as a vertex that cords of at least two cord layers among said cord layers of said auxiliary chafers arranged at inclination angles of 65°–90° and 35°–55° with respect to the meridional plane of the tire, respectively, and cords of the remaining cord layer of said auxiliary chafer are arranged at an inclination angle of −50°∼−70° with respect to the meridional plane.

4,700,765

RADIAL CARCASS PNEUMATIC TIRE HAVING TWO BEAD RINGS PER BEAD

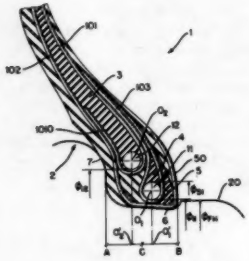
Pierre Masclaux, Enval, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Jul. 11, 1985, Ser. No. 754,066

Claims priority, application France, Jul. 19, 1984, 84 11750

Int. Cl.[4] B60C *15/05, 15/024*

U.S. Cl. 152—545 **9 Claims**



1. A tubeless tire having at least one radial carcass ply and at least one bead containing only two bead rings, the tire being mountable on a rim having at least one bead seat and an associated flange, wherein the axially inner end of the bead seat is terminated by a circumferential hump forming a stop for the axial retention of the bead, characterized by the fact that

(a) a first bead ring, of a meridian section of any shape, has a lower diameter such that the length of the circumference is between 0.99 times and 1.01 times the maximum developed length which a cord stretched around the hump can assumes in a plane perpendicular to the axis of rotation,

(b) the center of gravity of the meridian section of the first bead ring is located in the axially inner half of the width of the meridian section of the bead,

(c) a second bead ring, of a meridian section of any shape, has a lower diameter which is greater than the upper diameter of the first bead ring,

(d) the center of gravity of the meridian section of the second bead ring is located axially outward of the center of gravity of the meridian section of the first bead ring,

(e) the first and second bead rings being located directly above the bead seat and axially inward of the associated flange when the tire is mounted on the rim,

whereby upon axial stress on the mounted tire during turning the second bead ring moves axially towards the inside of the tire untile the second bead ring is located approximately above the hump while the first bead ring remains axially immovable so as to prevent unwedging of the bead.

4,700,766

PROCESS AND APPARATUS FOR RECLAIMING FOUNDRY SCRAP SANDS

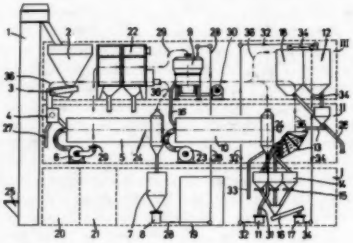
Volker Godderidge, Irdning, Austria, assignor to GSR Sandregenerierungsgesellschaft mbH, Irdning, Austria

Filed May 15, 1985, Ser. No. 734,744

Claims priority, application European Pat. Off., Jan. 10, 1985, 85890004.6

Int. Cl.[4] B22C *5/18*

U.S. Cl. 164—5 **7 Claims**



1. A process for reclaiming used foundry sand, comprising the steps of:

subjecting comminuted, used foundry sand containing organic and inorganic binders to a mechanical abrading treatment in the absence of added moisture, said abrading treatment being effected at a temperature of not more than about 300° C. and with sufficient force to separate sand particles contained in said used sand from said inorganic binders coated thereon;

heating the thus-abraded used sand at a temperature sufficient to ensure combustion of said organic binders; and

subjecting the thus-treated used sand to a further mechanical treatment for removing binder residues adhered to said sand particles from said sand particles.

7. Apparatus for reclaiming used foundry sand, comprising:

means for subjecting comminuted, used foundry sand containing organic and inorganic binders to a mechanical abrading treatment in the absence of added moisture, at a temperature of not more than about 300° C. and with sufficient force to separate sand particles contained in said used sand from said inorganic binders coated theron;

means for heating the thus-abraded used sand at a temperature sufficient to ensure combustion of said organic binders; and

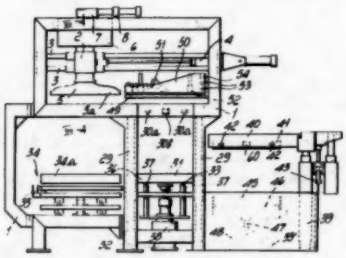
means for subjecting the thus-treated used sand to a further mechanical treatment for removing binder residues adhered to said sand particles from said sand particles.

4,700,767

MOLDING MACHINE FOR MOLDING-SAND CORES

Guido Peterle, Via Novara 37, Borgomanero (Prov. of Novara), Italy

Filed Sep. 16, 1986, Ser. No. 907,438
Claims priority, application Italy, May 13, 1986, 20406 A/86
Int. Cl.[4] B22C *15/24*
U.S. Cl. 164—201 8 Claims



1. A molding machine for molding-sand cores, comprising, in combination:

a supporting frame,

two opposite upper and lower dies, including one fixed die and one movable die carried by said supporting frame,

a sand injection head including a vertical cylindrical chamber, a cylindrical compressed air tank, coaxial to said chamber, and shutter means for feeding compressed air to said cylindrical chamber,

horizontal-axis supporting and guiding means for supporting and guiding said injection head from a working position to a lateral one and vice-versa,

vertical-axis guiding means for guiding said injection head, alternately and by means of a compressed-fluid device, from a raised position to a sealingly matching position with said upper die,

vertical guiding means, carried on said supporting frame and including a compressed-fluid operating device operatively connected to said movable die for alternately bringing said movable die closingly against said fixed die and subsequently bringing said movable die away from said fixed die,

gassing means for gassing a core formed in said dies, including a gassing plate and compressed-fluid operated guiding means operatively connected to and horizontally and vertically guiding said gassing plate for bringing said gassing plate alternately in engagement with said opposite dies, when they are in their closed condition, and then laterally away,

a movable plate device having extracting dowels, and a raising device, said movable plate device being associated with said lower die for extracting and lifting a formed core from said lower die,

a collet device, carried on said supporting frame and including a collet and lateral motion means for bringing said collet at said lower die, when said dies are in their opened condition, locking a formed core and for removing it from said lower die, and

programmed means for controlling the operation of said guiding means, said raising means and said lateral motion means, thereby controlling the operating phases of said machine from said cylindrical chamber filling with sand up to extraction of a formed core.

4,700,768

METAL CASTING PROCESS USING A LOST PATTERN, MOULDS FOR PERFORMING THIS PROCESS AND PROCESS FOR THE PRODUCTION OF SAID MOULDS

Georges Broihanne, Pau, and Pierre Magnier, Chatenay-Malabry, both of France, assignors to U.C.P.I. Societe pour l'Utilisation des Ceramiques et des Platres dans l'Industrie, Paris and Messier Fonderie D'Arudy, Arudy, both of, France

Continuation of Ser. No. 675,637, Nov. 28, 1984, abandoned.
This application May 23, 1986, Ser. No. 865,600
Claims priority, application France, Dec. 14, 1983, 83 20019
Int. Cl.[4] B22C *1/22, 9/04*
U.S. Cl. 164—361 8 Claims

1. A green mould for lost pattern casting with a shell, said shell comprising a graphite coating and a hydrocarbon binder, the binder incorporating a polyol with at least three alcohol functions, said polyol being stable to decomposition and melting at temperatures of 200° C. and below to preserve the binding capability of said binder.

4,700,769

CASTING APPARATUS FOR TITANIUM OR TITANIUM ALLOY

Isao Ohara, Toyonaka, and Seizo Nakamura, Osaka, both of Japan, assignors to Ohara Co., Ltd., Osaka, Japan

Filed Jun. 18, 1985, Ser. No. 746,101
Int. Cl.[4] B22D *27/02*
U.S. Cl. 164—514 14 Claims

1. An apparatus for casting titanium or an alloy of titanium consisting essentially of

(a) means for generating an argon electric arc, including an upper electrode and a lower electrode, the upper electrode including means for emitting argon from the periphery thereof and for directing the argon toward the lower electrode;

(b) a crucible positioned below the upper electrode, said crucible having

(1) an interior portion for receiving the titanium or alloy of titanium, at least said interior portion of the crucible consisting essentially of a metal oxide having a purity of at least 95% selected from the group consisting of magnesium oxide and zirconium oxide, the upper end of the lower electrode protruding out of the bottom of said interior portion of the crucible;

(2) an exit for molten titanium or titanium alloy located in said interior portion;

(c) means for rotating said crucible about an axis; and

(d) a mold consisting essentially of a metal oxide having a purity of at least 95% selected from the group consisting of magnesium oxide and zirconium oxide, positioned and arranged to rotate on the same axis of rotation and at the

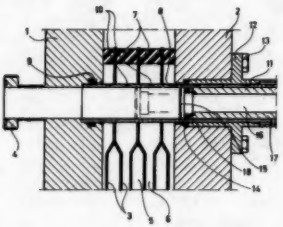
same speed as the crucible and to communicate with the exit of the crucible, said mold including a casting chamber for receiving molten metal flowing from the exit of the crucible as a result of centrifugal force generated when the crucible is rotated and further including discharge vents connecting the casting chamber with the outer atmosphere.

4,700,770

INLET DEVICE IN PLATE EVAPORATOR

Ulf Bolmstedt, Staffanstorp, and Björn-Olow Johansson, Lomma, both of Sweden, assignors to Alfa-Laval Food & Dairy Engineering AB, Lund, Sweden

Filed Sep. 11, 1985, Ser. No. 774,943
Claims priority, application Sweden, Oct. 10, 1984, 8405056
Int. Cl.[4] F28F *27/02*
U.S. Cl. 165—1 9 Claims



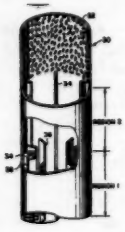
7. In the operation of a plate evaporator comprising a package of heat exchange plates defining plates interspaces, alternate interspaces being for a liquid to be evaporated by a heating medium flowing through others of said interspaces, said plates having openings therethrough aligned with each other to form a row of openings in the plate package, and inlet means at one side of the plate for supplying said liquid, the method which comprises inserting a tube through said row of openings from the side of the plate package opposite said one side, feeding said liquid from said inlet means to the upper portions of at least some of said alternate interspaces by way of holes in said tube, and withdrawing the tube from the plate package from said opposite side thereof.

4,700,771

MULTI-ZONE BOILING PROCESS AND APPARATUS

Douglas L. Bennett, Allentown; Keith A. Ludwig, Emmaus, and Alexander Schwarz, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 13, 1987, Ser. No. 2,909
Int. Cl.[4] F28F *13/18*
U.S. Cl. 165—1 19 Claims



1. In a process for boiling flowing liquids in a heat exchanger wherein a flowing liquid is heated to vaporize said liquid, the improvement of which comprises:

(a) passing said flowing liquid through a first heat tranfer zone wherein said liquid is subjected to an overall high-convective heat transfer and an overall high pressure drop in a plurality of steps characterized in that each consecutive step in the direction of flow exposes the liquid to a lower pressure drop than the preceding step; and then

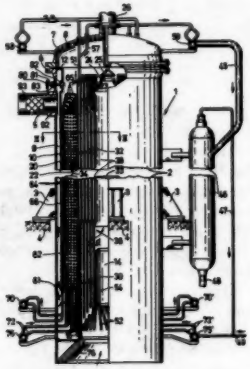
(b) passing said flowing liquid through a second heat transfer zone to expose the liquid to an enhanced nucleate boiling heat transfer surface and a lower pressure drop than the overall pressure drop in the first heat transfer zone.

4,700,772

HEAT EXCHANGER SYSTEM

Peter Baumberger, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 3, 1985, Ser. No. 752,394
Claims priority, application Switzerland, Jul. 5, 1984, 3253/84
Int. Cl.[4] F28F *27/02*
U.S. Cl. 165—103 13 Claims



1. A heat exchanger system for removing heat from a hot gas comprising

a pressure vessel;

a first duct part within said vessel for conveying a hot gas therethrough;

a centrally disposed displacement member coaxial of said duct part;

a pair of parallel branch ducts communicating with said first duct part to convey the hot gas therethrough, one of said branch ducts being in axial alignment with said first duct part and the other branch duct being cylindrical and coaxial with said displacement member;

a common mixing chamber communicating with said branch ducts to receive hot gas therefrom;

a first evaporation heating surface disposed in said first duct part and said one branch duct for conveying a working medium therethrough in heat exchange relation with the hot gas in said first duct part and said one branch duct;

an adjustable restrictor in at least one of said branch ducts for controlling a flow of hot gas therethrough;

a second duct part disposed in said vessel in communication with and downstream of said mixing chamber for conveying the hot gas therethrough;

a heat exchanger surface in said second duct part for conveying a working medium therethrough in heat exchange relation with the hot gas;

at least one lateral gas outlet communication in said pressure vessel; and

an annular chamber between said second duct part and said

pressure vessel, said annular chamber communicating with said second duct part and said gas outlet connection.

4,700,773

NESTED-TUBE HEAT EXCHANGER

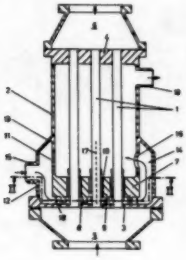
Wolfgang Kehrer, Berlin, Fed. Rep. of Germany, assignor to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed Jul. 11, 1986, Ser. No. 884,480

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1985, 3533219

Int. Cl.[4] F28F *19/00*

U.S. Cl. 165—134.1 **4 Claims**



1. A nested-tube heat exchanger comprisng: tubes for exchanging heat between media at substantially different pressures and at diferent temperatures; said tubes conducting a medium of higher inlet temperature; a jacket surrounding said tubes; tube plates for securing said tubes at each end; one of said tube plates being thinner than the other, so that one of said tube plates is a thick tube plate and the other one of said tube plates is a thin tube plate; said thick tube plate fastened to said jacket; a supporting plate with supporting fingers arranged at a distance from said the in tube plate, said thin tube plate being suspended from said supporting plate by said supporting fingers, said supporting fingers being fastened to said supporting plate; each tube extending through said supporting plate with an annular gap between the tube and said supporting plate; an inner supporting jacket fastened to said supporting plate; an outer supporting jacket fastened to said thin tube plate; said two supporting jackets being both attached to said jacket surrounding said tubes and demarcating an annular chamber; said outer supporting jacket having a connection for supplying water; said inner supporting jacket having an access aperture at a side of said of said chamber which is remote from said connection for supplying water.

4,700,774

OIL COOLER

Gebhard Schwarz, Stuttgart, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius F. Behr. GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 25, 1982, Ser. No. 436,384

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142028

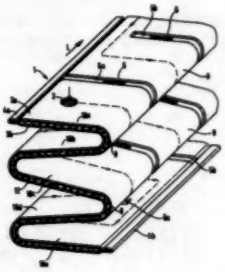
Int. Cl.[4] F28D *9/02, 1/02;* **F28F** *3/14*

U.S. Cl. 165—140 **4 Claims**

1. An oil cooling arrangement for cooling transmission oil in motor vehicles, comprising a water tank of a cooling radiator and an oil cooler disposed in said water tank of a cooling radiator and an oil cooler disposed in said water tank, wherein said oil cooler comprises:

a sheet metal body formed by two adjacent facing walls which are sealed at their edges;

a guide path formed within the sheet metal body by pressing and sealing the facing walls together to form guide seams in spaced positions along the length of the body, said guide seams extending alternately from respective edges over a substanial portion of the sheet metal body width;



wherein the sheet metal body is folded in a wave shape to form a plurality of lengthwise channels for passage of a cooling medium.

4,700,775

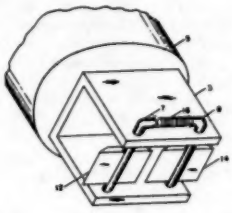
DUAL-ACTION RETRIEVING TOOL FOR OIL WELL SWABS

William D. Gramling, 5144 Newport Ave., Chevy Chase, Md. 20816

Filed Feb. 24, 1986, Ser. No. 832,444

Int. Cl.[4] E21B *31/18, 31/20*

U.S. Cl. 166—98 **4 Claims**



1. A tool for retrieving swabbing devices and downhole stands in a casing or tubing for oil wells and other like wells which comprises:

a support member, at least two jaws pivotably supported from said support member so that they are pivotable both clockwise and counterclockwise as seen from one side, said jaws each having holding means at their respective outboard aspects and at their respective inboard aspects and each having a pivot axis disposal effectively between its said respective outboard and inboard aspects;

resilient means interconnected to said jaws so that said jaws have their outboard aspects urged towards said casing or tubing and their inboard aspects urged away from said casing or tubing and towards each other, the arrangement being such that said jaws' holding means are enabled to pivot relative to their respective said pivot axes in first opposite directions around a centrally disposed object such as a swabbing device, in said casing or tubing so that the inboard aspects of each said holding means are urged by said resilient means to engage such object for lifting same, and also to pivot about their respective pivot axes in second opposite directions relative to their respective said pivot axes in contacting an object such as a down-hole stand disposed close to the interior walls of said casing or tubing again so that the outboard aspects of each said

holding means are urged to engage such latter object for lifting same.

4,700,776

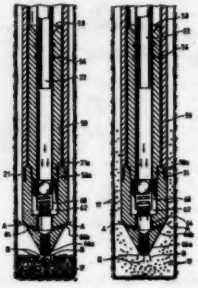
SAND CONTROL DEVICES AND METHOD OF INSTALLATION THEREOF

Ljubisa M. Petrovic, Houston, Tex., assignor to Well Improvement Specialists, Inc., Houston, Tex.

Division of Ser. No. 786,050, Oct. 10, 1985. This application Jun. 30, 1986, Ser. No. 880,557

Int. Cl.[4] E21B *7/26*

U.S. Cl. 166—157 **4 Claims**



1. A jet shoe adapted for connection to a lower end of a sand control device to allow for ejection of a working fluid through the bottom of the shoe for setting the sand control device in a fluid bearing formation at substantially the same elevational location as said fluid bearing formation, said jet shoe comprising a body formed with an internal cavity housing a check valve permitting the downward flow of working fluid into the cavity while restricting any upward flow of working fluid from the cavity; and means for connecting the jet shoe to a source of working fluid, said body being further formed with a downwardly extending passage in communication with the cavity to direct working fluid in a downward direction from the shoe; said body further including an upwardly extending passage in communication with the cavity to direct part of the working fluid out of the bottom of the shoe in an upward direction, wherein a bottom of the cavity is formed with a generally conical surface, the inlet port of the downwardly extending passage being formed in the conical surface proximate the apex thereof, the inlet port of the upwardly extending passage being formed at the intersection of the conical surface with the cylindrical side wall.

4,700,777

GRAVEL PACKING APPARATUS AND METHOD

Thomas J. Luers, Thornton, Colo., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 10, 1986, Ser. No. 850,473

Int. Cl.[4] E21B *34/12, 43/04*

U.S. Cl. 166—185 **6 Claims**

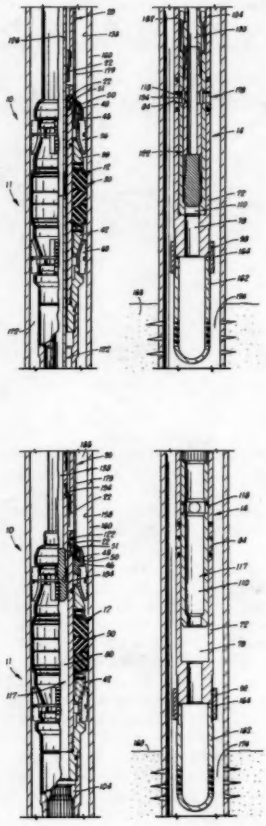
1. A downhole tool comprising:

packer means connected to a first tool string portion thereabove for packing off a portion of a well bore;

valve means adjacent and secured to said packer means and connected to a second tool string portion therebelow, said valve means having an open position defining transverse passageway means extending between the interior and exterior of said valve means and a closed position;

central passageway means extending longitudinally through said packer means and valve means for providing fluid communication between said first and second tool string portions; and

tubular stinger means extending downwardly from said first tool string portion into said central passageway for closure thereof, for engaging said valve means and longitudinally displacing same between said open and closed positions, and for providing fluid communication between said



first tool string portion and a well annulus below said packer means when said central passageway means is closed by the lower end of said stinger below said valve means, and said valve means is in said open position.

4,700,778

WET CONNECTOR FOR USE WITH DRILL PIPE CONVEYED LOGGING APPARATUS

Michael L. Smith, Sand Springs, Okla., and Donald E. Hensley, Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 24, 1986, Ser. No. 889,029

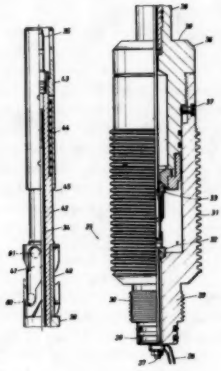
Int. Cl.[4] E21B *23/08, 43/112, 47/00*

U.S. Cl. 166—250 **18 Claims**

1. For use in a logging tool system positioned in a well borehole by a drill string and exposed to drilling fluid in the well, a connective apparatus enabling the logging tool system to be selectively connected to a conductor system in a wireline, the connective apparatus comprising:

(a) a wet connector having:

(1) a lower end located terminal means adapted to be connected to a logging tool system on a drill pipe conveyed logging system;
(2) an upwardly facing first electrical mating means connected to said terminal means;
(3) an upwardly facing first mechanical mating means;
(b) a wireline supported overshot having:
(1) means connecting to a wireline;
(2) second electrical mating means;
(3) second mechanical mating means;
(c) wherein:
(1) said overshot positions said first and second mechanical mating means for achieving positive mechanical connection after travel of said overshot through said drill pipe;
(2) said first and second electrical mating means achieve electrical connection to provide an electrical path from said logging system to said wireline;
(3) said positive mechanical connection avoids placing a mechanical load on said electrical mating means;
(4) said overshot is retrievable along said drill pipe after release of said mechanical and electrical connections;
(5) said wet connector electrical mating means is concentric within said upwardly facing first mechanical mating means; and



(6) said first mechanical mating means includes a telescoping sleeve resiliently forced upwardly around said first electrical mating means and including means on said overshot for forcing said sleeve downwardly to expose said upwardly facing first electrical mating means.

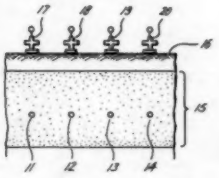
16. A method of preparing to conduct logging operations a highly deviated well borehole comprising the steps of:
(a) running a string of drill pipe into a highly deviated well borehole with a logging system attached thereto and positioning the logging system at a location in the well borehole to conduct logging operations;
(b) connecting a wet connector to said logging system within the drill string;
(c) running an overshot on a wireline through the drill string until said overshot arrives at said wet connector;
(d) making a mechanical connection between said overshot and said wet connector;
(e) making an electrical connection between said overshot and said wet connector to provide a signal path from said logging system along said wireline to enable logging signals to be sent along said wireline extending to the top of the highly deviated well; and
(f) wherein said wet connector includes a guard sleeve enclosing an electrical connector means, and wherein said overshot moves said guard sleeve to expose said electrical connector means for connection thereto.

4,700,779

PARALLEL HORIZONTAL WELLS

Wann-Sheng Huang, and Margaret A. Hight, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 4, 1985, Ser. No. 794,369
Int. Cl.[4] E21B *43/24, 43/30*
U.S. Cl. 166—263 **7 Claims**



1. A process for recovering hydrocarbons from an underground hydrocarbon formation, which comprises
drilling and completing at least three wells, a first well, a second well and a third well, into an underground hydrocarbon formation, with a portion of said wells extending through the formation in a substantially horizontal direction, said wells being substantially parallel to each other and spaced apart from each other in a substantially horizontal direction, said second well being positioned in the formation between the first and the third wells;
injecting steam into the formation through the first and second wells;
continuing steam injection through the first well and producing formation hydrocarbons through the second well;
injecting water into the formation through the first well and injecting steam through the second and third wells about the time of steam breakthrough at the second well; and
continuing water injection through the first well and steam injection through the second well and producing formation hydrocarbons through the third well.

4,700,780

METHOD OF REDUCING FLUID LOSS IN CEMENT COMPOSITIONS WHICH MAY CONTAIN SUBSTANTIAL SALT CONCENTRATIONS

Lance E. Brothers, Ninnekah, Okla., assignor to Halliburton Services, Duncan, Okla.

Filed Mar. 27, 1987, Ser. No. 31,493
Int. Cl.[4] E21B *33/14*
U.S. Cl. 166—293 **17 Claims**

12. The method of cementing a conduit penetrating a permeable earthen formation comprising:
introducing a cementing composition into the space between said conduit and said formation, said cementing composition comprising:
cement,
an aqueous fluid containing dissolved salt,
a fluid-loss additive comprising a polymer comprising:
2-acrylamido-2-methylpropanesulfonic acid or its salts, styrene and acrylic acid or its salts, the molar ratio of said 2-acrylamido-2-methylpropanesulfonic acid to said styrene to said acrylic acid being in the range of from about 4:4:2: about 6:3:1; and allowing said cementing composition to set within said space.

4,700,781

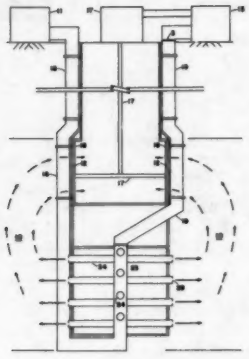
HEAVY CRUDE OIL PRODUCTION TOOL AND METHOD

Reuben C. McFarlane, P.O. Box 11, Elkhart, Tex. 75839

Continuation-in-part of Ser. No. 523,706, Aug. 16, 1983, abandoned. This application Dec. 9, 1985, Ser. No. 806,445

Int. Cl.[4] E21B *43/24*

U.S. Cl. 166—303 **3 Claims**



1. The method of extracting subterranean oil deposits from a borehole, comprising the steps of:

establishing a tube arrangement, which contains a set of orifices and filter means for each of said orifices, in said borehole, adjacent to an oil bearing formation;

placing an independently operating pumping means in said borehole directly above said tube arrangement;

adding steam from an above ground source;

pressurizing said steam down through the said tube arrangement, through said filter means, and out of said orifices to heat the said oil bearing formation;

causing the heated oil, from said oil bearing formation, to flow to the said independently operating pumping means during said steam pressuring step;

causing the said heated oil to be delivered to the ground surface; and further allowing said heated oil to enter through said orifices and pass through said filter means by regulating the pressure of the said steam; and

allowing the said heated oil to be delivered to the ground surface by way of the said tube arrangement, by the said pressure of the steam.

4,700,782

FLOW CONTROL VALVE FOR USE IN OIL AND GAS WELLS AND THE LIKE

Norman W. Read, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 7, 1986, Ser. No. 928,445

Int. Cl.[4] E21B *34/12*

U.S. Cl. 166—330 **8 Claims**

1. An improved flow control valve assembly for use in oil and gas wells and the like comprising:

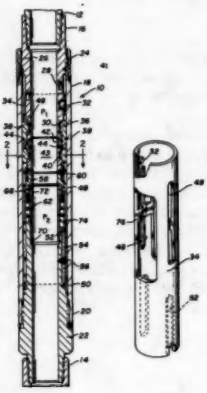
an elongated, cylindrical valve body member;

a first tubular connector member rotatably disposed within a first end of said body member and having one end arranged for connection to a first tubular member;

a second tubular connector member disposed in and connected to a second end of said body member and having a first end arranged for connection with a second tubular member and a second end forming an annular valve seat;

a ball valve member located in said valve body member adjacent to said seat and pivotal therein between a closed position preventing and an open position permitting flow through said first and second tubular connector members and valve body member;

valve actuator means including a valve actuator member located for reciprocal movement between said valve body member, valve member, and first and second tubular connector members, said valve actuator member having an actuator pin and an actuator gudgeon located thereon,



said gudgeon engaging said first tubular connector member for changing rotational movement of said first tubular connector member to reciprocal movement of said valve actuator member and pin and said actuator pin engaging said valve member for changing the reciprocal movement of said pin into pivotal movement of said valve member whereby said valve member pivots between said open and closed positions.

4,700,783

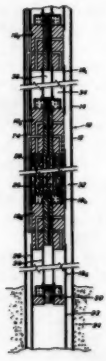
METHOD AND APPARATUS FOR RECOVERING LIQUIDS FROM A WELL BORE

Paul C. Baron, 3612 Watchill Rd., Munhall, Pa. 15120

Filed Jun. 20, 1985, Ser. No. 746,712

Int. Cl.[4] E21B *34/08, 43/12*

U.S. Cl. 166—372 **14 Claims**



1. In a well liquid recovery apparatus wherein an elongated vertically extending pipe string includes a plurality of valve means spaced vertically apart by elongated pipe sections, each

of which pipe sections is subdivided to define therein a pair of vertically coextensive chambers whereby a body of liquid contained therein comprises a pair of upper surface portions of such body of liquid, and each said valve means is operable in response to the level of such a body of liquid contained within the pipe section directly subjacent thereto to expose one of said upper surface portions of the contained liquid to well pressure in a manner that the well pressure moves the contained liquid upwardly via the respective said valve and into the pipe section directly above said valve, and wherein each said valve is operable to prevent backflow of liquid from the pipe section directly above the pipe section directly below said valve, the improvement comprising:

the interior of each of said pipe sections being maintained in substantially continuous open fluid communication with the ambient atmosphere via a vent path including passages in the valve directly upwardly adjacent said pipe section such that a body of liquid contained within said interior of said pipe sections is continuously exposed to ambient atmospheric pressure.

12. In a method for recovering liquids from an elongated, vertically extending pipe string within a well bore wherein a volume of liquid within the pipe string is elevated in discrete steps upwardly through the pipe string by application of pressure to the volume of liquid at discrete vertical intervals corresponding to said discrete steps upon opening of vertically spaced valves which are actuated in response to the rising level of the liquid within the pipe string produced by elevation of the volume of liquid in a preceding discrete step, the improvement comprising:

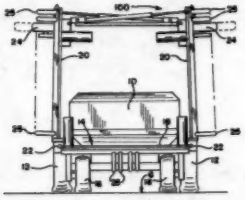
continuously venting the spaces within said pipe string immediately upwardly adjacent to the rising surface of said volume of liquid substantially continuously throughout said elevating thereof within said pipe string.

4,700,784

COMBINED DEPTH-CONTROL AND WING-LIFT HYDRAULIC CIRCUIT

Kenneth J. Wiebe, Dundas; J. Richard Harwood, Innerkip, and Russell J. Martin, Ohsweken, all of Canada, assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 31, 1986, Ser. No. 824,415
Int. Cl.[4] A01B 73/02
U.S. Cl. 172—126 **16 Claims**



1. In an implement having a tool bar spaced above the ground, the tool bar including at least one wing pivotally connected thereto and a wing wheel mounted on the wing for operationally supporting the wing on the ground, a combined depth-control, wing-lift and wing wheel tuck circuit comprising:

depth-control means for raising and lowering the tool bar relative to the ground;

wing-lift means for causing the wing to be partially rotated about the tool-bar pivot between a substantially horizontally-disposed position and a substantially vertically-disposed position, relative to the ground; and

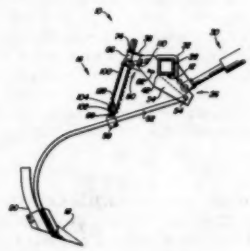
wheel-tuck means for moving the wing wheel between an inwardly-drawn position proximate to the wing and second position spaced further from the wing than the inwardly-drawn position, and for causing the wing wheel to be disposed in one of these two wheel-spacing positions for a first preselected period of time.

4,700,785

FURROW OPENER ASSEMBLY WITH INTEGRAL DOWN-PRESSURE ADJUSTMENT

Robert J. Bartusek, Des Moines; Ronald M. Steilen, Ankeny, and Vernon E. Rettig, Bondurant, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 24, 1986, Ser. No. 843,418
Int. Cl.[4] A01B 35/24
U.S. Cl. 172—705 **11 Claims**



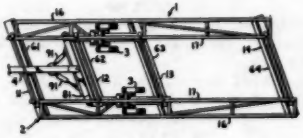
1. A shank assembly adapted for connection to an implement for forward movement over the ground, said assembly comprising a generally channel-shaped bracket, means for attaching the bracket to the implement so that the bracket opens rearwardly; a shank pivotally connected to and extending rearwardly from the lower end of the bracket for rocking in an upright plane; a tension link connected to the shank rearwardly of the pivotal connection with the bracket and extending upwardly therefrom towards the mounting bracket, said mounting bracket including retaining means for slidably receiving the upper end of the link therethrough, said upper end of the link including means for preventing the shank from rocking downwardly below a preselected location; a compression spring encircling the link; and an adjustable arm connected to the bracket and including sping engaging means, located below and movable relative to the retaining means, for adjustably compressing the spring to one of a plurality of compressed states to establish downward bias on the shank without affecting the preselected downward location of the shank.

4,700,786

DRAG-TYPE ROAD GRADER

Vernon D. Berry, Winona, Kans., assignor to Logan Western Road, Inc., Winona, Kans.

Continuation-in-part of Ser. No. 616,680, Jun. 14, 1984, Pat. No. 4,568,219. This application Dec. 16, 1985, Ser. No. 809,270
Int. Cl.[4] E02F 3/76
U.S. Cl. 172—799.5 **16 Claims**



1. A road grader scraper blade lift mechanism comprising:

(a) a road grader frame having a front end, a rear end, and opposite sides;

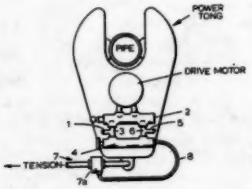
(b) an elongated road grader blade including a pair of spaced apart blade standards upstanding from said blade;
(c) a pair of blade supports positioned in axially vertical orientation and in laterally spaced relation on said grader frame;
(d) one of said pair of blade standards and said pair of blade supports being tubular and slidably receiving the other of said pairs respectively therein;
(e) a pair of rocker members pivotally connected respectively to one of said pair of blade standards and said pair of blade supports, each rocker member including a top leg, a bottom leg, and a side leg;
(f) a pair of anchor links pivotally connected respectively between said side legs to said rocker members and said grader frame;
(g) a pair of crossed scissor arms pivotally connected respectively from the upper leg of each rocker member to the lower leg of the other rocker member; and
(h) an extendible ram pivotally connected between said scissor arms whereby upon the extension and retraction of said ram said blade is moved vertically.

4,700,787

POWER TONG TORQUE CONTROL

David A. Buck, 4225 Hwy. 90 East, Broussard, La. 70518, and Ronald N. James, 111 Edie Ann Dr., Apt. 137, Lafayette, La. 70508

Filed Oct. 3, 1985, Ser. No. 783,698
Int. Cl.[4] E21B *5/00*
U.S. Cl. 173—164 **5 Claims**



1. Torque controlled powered pipe tongs, the apparatus comprising:
(a) a power tong powered by a fluid motor;
(b) a fluid power source connected to said motor;
(c) a force conducting element attached to said power tong, situated to oppose reaction torque from said tongs when torque is applied to pipe;
(d) force sensing means operatively associated with said force conducting element situated to sense at least part of the force experienced by said force conducting element, arranged to produce a pressure signal proportional to force sensed; and
(e) a fluid by-pass valve, adjustably biased toward a closed position, responsive to said signal to tend to move toward an open position, said by-pass valve connected between said fluid power source and said motor.

4,700,788

DIRECTIONAL DRILLING PIPELAY

Carl G. Langner, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 6, 1985, Ser. No. 731,204
The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.
Int. Cl.[4] E21B *7/04*
U.S. Cl. 175—61 **13 Claims**

1. A method for laying a pipeline beneath a seabottom subject to ice gouging, comprising:
forming a borehole with drilling means;
gripping the inside of the borehole with at least one tractor;
applying thrust from said at least one tractor to propel the drilling means forward until a deep arcuate borehole is

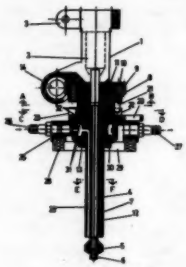
formed beneath the seabottom sufficiently deep to avoid ice gouging and
inserting a pipeline into the borehole.

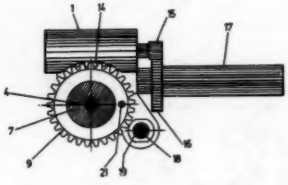
4,700,789

DEVICE TO OBTAIN RING-SHAPED CAVITIES IN THE BOTTOM OF DRILLED HOLES MADE IN ANY TYPE OF MEDIUM

Vicente S. Velasco, Canillas 93-4º-A, Madrid, Spain

Filed Mar. 19, 1986, Ser. No. 845,073
Claims priority, application Spain, Dec. 31, 1985, 550611
Int. Cl.[4] E21B *10/32, 10/66*
U.S. Cl. 175—202 **11 Claims**





1. An apparatus for forming an annular cavity in a wall of a hole in a surface of a medium, the apparatus engagable with a means for rotation, the apparatus comprising:
a body;
an axle rotatable within said body and having a first end and an opposite end, said first end being connectable with said rotation means so as to be rotated by the latter;
a reamer united with said opposite end of said axle and being rotatable therewith;
an inner enveloping part extending from said body to said reamer and having a cylindrical shape with a first cavity, said first cavity housing said axle, said axle being eccentrically arranged in said first cavity, said inner enveloping part being rotatable with respect to said body; and
an outer enveloping part having an axis and a cylindrical shape with a second cavity, said second cavity housing said inner enveloping part, said inner and outer enveloping parts being eccentrically arranged relative to each other so as to provide relative eccentricities, said inner

and outer parts being formed to be rotatable relative to each other into an insertable position in which both said inner and outer enveloping parts are insertable into the hole such that said reamer is aligned coaxially with said axis of said outer enveloping part and also said first and second cavities are counterposed with respect to each other so that said relative eccentricities oppose each other in opposite directions, said reamer being formed so as to project radially outward no further than does said outer enveloping part while said inner and outer enveloping parts are in said insertable position, said inner and outer enveloping parts also being formed to be rotatable relative to each other out of said insertable position to radially project said reamer outward beyond said outer enveloping part and into the wall of the hole, said inner and outer enveloping parts being formed to thereafter be jointly rotatable to cause said reamer to rotate in a planetary manner to thereby form the annular cavity in the hole.

4,700,790

ROTARY DRILL BITS

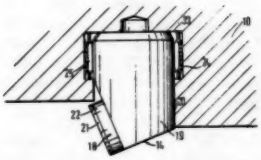
David Shirley, Cheltenham, England, assignor to NL Petroleum Products Limited, Gloucestershire, England

Filed Feb. 26, 1985, Ser. No. 706,060

Claims priority, application United Kingdom, Feb. 28, 1984, 8405180

Int. Cl.⁴ E21B *10/58*

U.S. Cl. 175—410 **9 Claims**



2. A rotary drill bit, for use in drilling or coring holes in subsurface formations, comprising a bit body having a shank for connection to a drill string, a plurality of cutting elements mounted at the surface of the bit body, and a passage in the bit body for supplying drilling fluid to the surface of the bit body, at least some of the cutting elements each being mounted on a carrier which is received in a socket in the bit body, said socket having a recess therein, there being provided within the socket, at least partly in the recess, and disposed around at least a portion of the periphery of the carrier, resiliently compressible retaining means which are formed separately from the carrier and bit body and are resiliently compressed between the carrier and the wall of the socket so as frictionally to retain the carrier in the socket.

4,700,791

ELECTRONIC SCALE PRINTER

Yoshitaka Iwasaki; Kunio Mori, and Yoshio Tanabe, all of Tokyo, Japan, assignors to Teraoka Seiko Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 705,533, Feb. 26, 1985, Pat. No. 4,598,780. This application Apr. 16, 1986, Ser. No. 852,642

Claims priority, application Japan, Mar. 2, 1984, 59-39844; Mar. 2, 1984, 59-39845; Mar. 8, 1984, 59-44876; Mar. 8, 1984, 59-33898[U]; Dec. 28, 1984, 59-278899

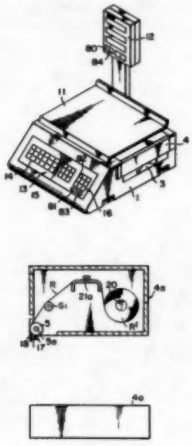
Int. Cl.⁴ G01G *23/38*; G01D *9/00, 15/34*; B41J *7/00*

U.S. Cl. 177—2 **33 Claims**

1. A printer for printing data on a printing sheet comprising:

(a) means for selectively storing different types of printing sheets, said storing means being removably attached to said printer;

(b) first detecting means for detecting the type of printing sheet which is selectively stored in the storing means when said storing means is mounted to the printer; and



(c) printer control means operatively connected to said printer and which comprise means for controlling printing in response to detection by the detecting means.

4,700,792

INDICATION METHOD IN BALANCE WITH ITEM INDICATOR

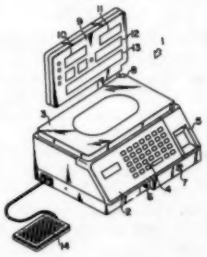
Noriyasu Tajima; Yasuhiro Sakura; Takashi Futakata; Kouji Senda, and Kazuaki Seki, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 9, 1986, Ser. No. 861,410

Claims priority, application Japan, May 15, 1985, 60-103531

Int. Cl.⁴ G01G *23/32, 23/22*

U.S. Cl. 177—178 **4 Claims**



1. In a balance having an item indicator for indicating an item upon setting of said item and registering of said item, an alternate display for the item indicator comprising preliminary setting of at least one messages to be indicated by said item indicator when a selected item has not been entered,

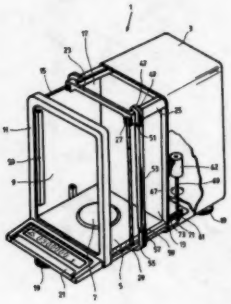
storing said messages in a memory, indicating said item upon setting of said item and when weight indication is greater than zero and selectively calling said messages by a control means to indicate said messages by said item indicator when weight indication is zero or less than zero and this condition continues for a fixed time.

4,700,793

PRECISION BALANCE

Paul Lüchinger, Uster, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Nov. 14, 1986, Ser. No. 931,546
Claims priority, application Switzerland, Feb. 28, 1986, 835/86
Int. Cl.[4] G01G *23/18, 21/28*
U.S. Cl. 177—181 14 Claims



1. A precision balance, comprising a balance housing, a balance base supporting the balance housing, a weighing dish placed on the balance base and surrounded by a weighing chamber located in front of the balance housing, the weighing chamber defined by a stationary front pane mounted on the balance base on the side of the weighing chamber opposite the balance housing, two rearwardly sliding side doors and a rearwardly sliding upper cover, a support member placed on top of the side doors, the support member including side parts resting on the top edges of the side doors and forming a connecting means between the upper cover and the side doors, a guide means supported in the balance housing for guiding the side parts, wherein the side parts are slidable rearwardly into or over the balance housing.

4,700,794

VEHICLE STEERING APPARATUS

James R. Bernhagen, Eldridge; Elmer R. Crabb, Davenport; Marilyn S. Murphy, Bettendorf, all of Iowa; Daniel G. Roley, Metamora, Ill.; Gene R. St. Germain, Clarendon Hills, Ill., and James H. Tunnell, Washington, Ill., assignors to Caterpillar Inc., Peoria, Ill.

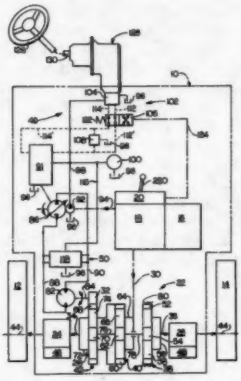
Filed Jul. 14, 1986, Ser. No. 885,342
Int. Cl.[4] B62D *11/18*
U.S. Cl. 180—6.44 42 Claims

1. A vehicle steering apparatus for a vehicle having a steering input control member rotatable about a central axis and a mechanism drivingly connected to left and right ground-engaging members, comprising:

pump and motor means for controllably applying torque to the mechanism for steering the vehicle and including a steering pump and a displacement control for the steering pump;

control valve means for controllably delivering fluid under pressure to the displacement control, the control valve means including a right turn control valve and a left turn control valve in juxtaposed relation; and

steering means for converting the rotational movement of the input control member away from a centered position to linear actuation of a selected one of the control valves, the steering means including a first actuator mounted for rotation about the central axis and operatively connected to the right turn control valve and a second actuator



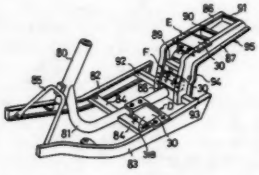
mounted for rotation about the central axis and operatively connected to the left turn control valve.

4,700,795

MOTORCYCLE WITH AN ENCLOSED BATTERY MOUNTED TO HAVE A PREDETERMINED ANGULAR RELATION WITH RESPECT TO THE BODY FRAME

Michio Yashima, Kawagoe, and Shuji Takahashi, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 532,225, Sep. 14, 1983, abandoned. This application Jan. 8, 1986, Ser. No. 817,113
Claims priority, application Japan, Sep. 14, 1982, 57-160666
Int. Cl.[4] B60K *1/04*
U.S. Cl. 180—68.5 2 Claims



1. A motorcycle having a body an equipped with an enclosed battery comprising:

a frame structure including an upper substantially horizontal part and a lower substantially horizontal part;

body equipment mounted on said frame structure;

said enclosed battery includes a battery case having first side faces, second larger side faces, positive plates and negative plates arranged alternately and parallel to said first side faces, separators provided in each space between a positive plate and a negative plate which face each other, and electrolyte absorbed by said separator;

said enclosed battery is operatively positioned at a position lower than said upper substantially horizontal part of said frame structure such that said second larger side faces of said battery case lie substantially horizontally;

said frame structure includes:

a head pipe through which a steering column is inserted;

a generally L-shaped down tube connected to said head pipe and extending substantially downwardly from said head

pipe in its front portion and subsequently substantially horizontally in its rear portion; and

a pair of side yokes connected to said down tube via cross members and positioned substantially horizontally on both sides of said rear portion of said down tube, in which said rear portion of said down tube and said side yokes form said lower substantially horizontal part of said frame structure, and

wherein said enclosed battery is operatively positioned between said rear portion of said down tube and one of said side yokes such that said first side faces of said battery case are substantially parallel to said rear portion of said down tube and side yokes, thereby mounting said enclosed battery substantially horizontally on said motorcycle.

4,700,796

REAR AXLE FOR A MOTOR VEHICLE, ESPECIALLY FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

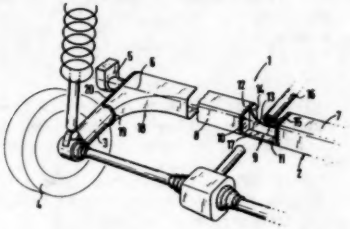
Albrecht Morlok, Nordstetten, and Hans Weigele, Stuttgart, both of Fed. Rep. of Germany, assignors to Dr. Ing. H.c.f. Porsche AG, Weissach, Fed. Rep. of Germany

Filed May 29, 1986, Ser. No. 868,052

Claims priority, application Fed. Rep. of Germany, May 29, 1985, 3519201

Int. Cl.⁴ B60G *3/00*

U.S. Cl. 180—88 **15 Claims**



1. A rear axle for a motor vehicle, comprising a torsionally soft cross bearer means which includes longitudinal guide members welded to the ends of the cross bearer means, the wheels being adapted to be retained at the longitudinal guide members, bearing means for pivotally supporting the cross bearer means together with the guide members at a relatively fixed vehicle part, said bearing means being arranged substantially in the center axis of the cross bearer means, the cross bearer means including a center section with an opening for a drive shaft and said opening having such a size that the drive shaft lies approximately inside of the interior contour formed by the cross section of the cross bearer means; and

wherein the center section essentially consists of a U-profile with a reinforcing web arranged between the legs thereof which is directed substantially vertically, extends in the vehicle transverse direction and is provided with a recess forming the opening.

4,700,797

PROPULSION CONTROL SYSTEM FOR MOTOR VEHICLES

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Dec. 19, 1986, Ser. No. 943,485

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1985, 3545545

Int. Cl.⁴ B60K *17/34*

U.S. Cl. 180—197 **6 Claims**

1. In a motor vehicle having a permanent drive for the wheels of one axle via a lockable differential gear and having a drive that, for the wheels of at least one other axle that can be connected via wheel couplings with their driving axles that can be driven by an engageable transfer transmission via a differential, the improvement comprising:

speed sensors means for all drivable wheels and the output shaft of the transfer transmission causing the connectable drive to said other axle; and

electrofluidic means for shifting the wheel couplings,

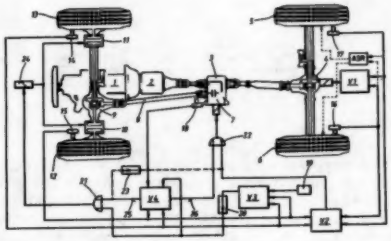
a first comparator means for receiving the output signals of the speed sensors means of the permanently driven wheels, and for emitting an output signal when the difference of the wheel speeds exceeds an indicated value,

the output signal of the first comparator means being connected as the control signal for the lock of the differential,

a second comparator means for receiving the output signals of the speed sensors means of all wheels, for forming a median speed signal, for determining threshold values from said median speed, for comparing the individual output signals of the speed sensors means with assigned threshold value, and for emitting an output signal when one of these speed sensor output signals exceeds the assigned threshold value,

steering angle sensor means

a third comparator for receiving the output signals of the speed sensors means of the connectably driven wheels and of said steering angle sensor means and for emitting an output signal when a quantity formed from these signals



characterizing the condition of movement of the motor vehicle exceeds a limit value that is assigned to the steering angle and the driving speed,

a fourth comparator means for receiving the output signals of the speed sensors means of the connectibly driven wheels, of the speed sensor means of the output shaft of the transfer transmission and of the third comparator means, for emitting, at a first output, a first output signal when the output signal of the speed sensor means of the output shaft is within a tolerance range of the output signal of the speed sensor means of the more slowly turning connectably driven wheels, and for emitting, at a second output, a second output signal when the output signal of the third comparator means and the first output signal of the fourth comparator means exist simultaneously,

a first OR-means for receiving inputs from the output of the second comparator means and the second output of the fourth comparator means and for emitting an output signal as the control signal for the coupling of the transfer transmission when either input is present, and

a second OR-element for receiving inputs from output of the third comparator means and the first output of the fourth comparator means, and emitting an output signal as the control signal for the wheel couplings when any of its inputs is present.

4,700,798

DRIVER TRAINING APPARATUS FOR SIMULATING SKID CONDITIONS OF AN AUTOMOBILE

Alf I. Johansson, Hulte Endre, S-62177 Visby, and Bengt R. Rosendahl, Humlegårdsvägen 14, S-62146 Visby, both of Sweden

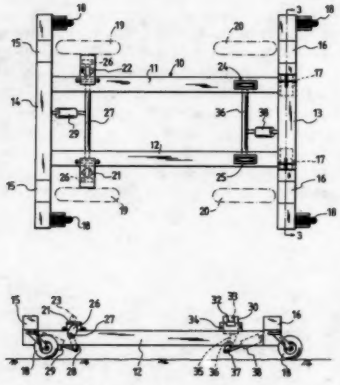
PCT No. PCT/SE84/00006, § 371 Date Aug. 14, 1984, § 102(e) Date Aug. 14, 1984, PCT Pub. No. WO84/02689, PCT Pub. Date Jul. 19, 1984

PCT Filed Jan. 13, 1984, Ser. No. 641,951

Claims priority, application Sweden, Jan. 14, 1983, 8300173

Int. Cl.[4] B62D *61/12;* B60S *9/02;* G09B *9/04*

U.S. Cl. 180—209 4 Claims



1. An apparatus for enabling regulatable alteration of the frictional grip between the wheels of a car and a substructure such as a road, comprising a separate lifting frame (10) carried by four castor wheels (18, 18A, 18B) and a plurality of supporting means (21, 22, 24, 25) for bearing against predetermined places (23, 33) on the underside of the car chassis in question after placing the frame under the car, the mutual spacing between the castor wheels being such that after placing the frame under the car, the castor wheels are each in the area around a car wheel (19), and selectively controlled operating means (29, 38, 43, 44, 47, 50) on the frame for exerting any selected one of a plurality of different lifting pressures on the car relative the substructure such that at least one of the car wheels has a contact pressure against the substructure reduced to a corresponding one of a plurality of different reduced contact pressures, thereby to simulate driving on a more or less slippery driving surface.

4,700,799

FRAMELESS MOTORCYCLE

Akio Kawano, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1986, Ser. No. 877,895

Claims priority, application Japan, Jun. 25, 1985, 60-138185

Int. Cl.[4] B62K *25/16, 25/20*

U.S. Cl. 180—219 4 Claims

1. A frameless motorcycle (1) comprising:

a front wheel (10);

a suspension (7, 8, 9, 11, 12, 13, 5*a*, 5*b*) for said front wheel (10), said suspension including an upper front swing arm (7) and a lower front swing arm (8) cooperating with each other to support said front wheel (10) at the front ends thereof;

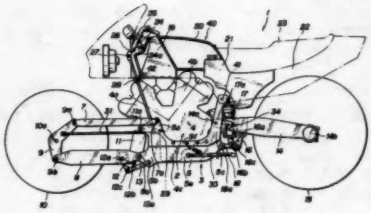
a rear wheel (15);

an engine (4); and

an attachment member (3) consisting of a bottom wall portion (6) and left and right side wall portions 5, 5 continued to the left and right ends of said bottom wall portion (6) when viewed from ahead of the vehicle;

said attachment member (3) covering the lower portion of said engine (4) attached thereto;

both of said front swing arms (7,8) being pivotably attached at rear end parts thereof to said side wall portions (5,5) of said attachment member (3); and



the parts of said lower front swing arm (8) attached to said side wall portions (5,5) of said attachment member (3) being offset inwardly of the vehicle by a predetermined distance (l) from the parts of said upper front swing arm (7) attached to said side wall portions (5,5) of said attachment member (3).

4,700,800

DRIVE SYSTEM FOR MOTOR VEHICLES

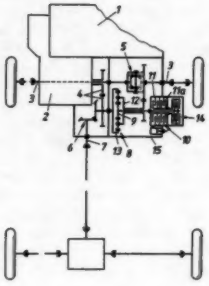
Karl Friedrich, Leibnitz, and Heribert Lanzer, Gössendorf, both of Austria, assignors to Steyr-Daimler-Puch AG, Vienna, Austria

Filed Feb. 9, 1987, Ser. No. 12,735

Claims priority, application Austria, Feb. 11, 1986, 331/86

Int. Cl.[4] F16H *37/08;* B60K *17/34*

U.S. Cl. 180—249 5 Claims



1. In a drive system for use in a motor vehicle having a direction of travel and having an axis which is transverse to said direction of travel, a change-speed transmission adapted to be driven by said motor and having an output member adapted to be nonrotatably connected to a first idler gear, two front axle drive shafts which are transverse to said direction of travel, a rear axle assembly extending transversely to said direction of travel,

a rear axle drive shaft extending in said direction of travel and coupled to said rear axle assembly to drive the latter, said drive system comprising,

a front axle differential adapted to be coupled to said output member and coupled to said front axle drive shafts to drive the latter,

an angle drive adapted to be coupled to said rear axle drive shaft to drive the latter,

the improvement residing in that said drive system comprises:

a planetary gear train comprising first, second and third torque-transmitting members,

a detachably mounted second idler gear adapted to mesh with said first idler gear and operatively connected to said angle drive to drive the latter, and

a liquid friction coupling having a first coupling half which is held against rotation and a rotatable second coupling half coupled to said third torque-transmitting member, wherein

said first torque-transmitting member is operatively connected to said second idler gear,

said second torque-transmitting member is operatively connected to said front axle differential, and

said differential, planetary gear train, liquid friction coupling, and angle drive constitute a subassembly.

4,700,801

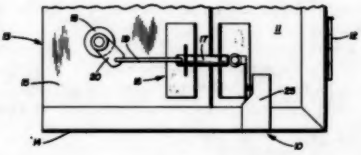
VEHICLE ANTITHEFT DEVICE

George B. Ailing, 10777 Julie Ave., Alliance, Ohio 44601

Filed Jan. 7, 1985, Ser. No. 689,295

Int. Cl.[4] B60R *25/04*

U.S. Cl. 180—287 **3 Claims**



1. Vehicle antitheft device construction for a vehicle including a vehicle frame, a vehicle door mounted on the frame, an ignition switch and a starter operable in response to closing the ignition switch, said door being movable from open to closed positions to prevent access to the vehicle interior when in closed position, said ignition switch being operable from the vehicle interior at a position spaced from the door, dead bolt lock means mounted on the vehicle for operation from locked to unlocked position between the frame and the door, security means for operating the dead bolt lock, said security means being operable from the exterior of the vehicle, normally closed switch means in series circuit with the ignition switch and starter, said switch being operable by said dead bolt lock to open said switch when said dead bolt is in locked position, and said dead bolt locking said door in closed position when said dead bolt is in locked position, whereby said starter can only be operated by said ignition switch when said dead bolt lock is in unlocked position and said switch means is closed.

4,700,802

MATERIAL HANDLING VEHICLE HAVING REMOTE TRANSMISSION CONTROLLER

Gerald E. Fought, Sugarcreek, Ohio, assignor to The Gradall Company, New Philadelphia, Ohio

Filed Dec. 11, 1985, Ser. No. 807,573

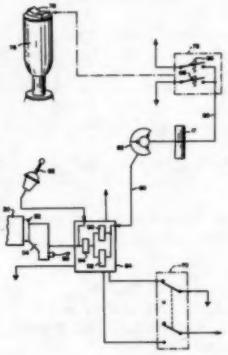
Int. Cl.[4] B60K *26/00;* **B62D** *1/22*

U.S. Cl. 180—324 **8 Claims**

1. Apparatus for remotely controlling the solenoid controlled transmission of a material handling vehicle which includes a lower chassis having an engine and said transmission, which lower chassis supports an upper structure having a material handling implement and upper cab, from said upper cab, comprising:

a. a means for impressing a source reference potential in a single control wire which passes from said upper cab to said lower chassis;

b. a switch mounted in said upper cab, said switch having a first contact which is selectively engageable with a source of potential which is higher than said reference potential and a second contact which is selectively engageable with ground, the open sides of said first and said second contacts being connected to said control wire;



c. means for determining whether the potential in said control wire is greater than, less than or equal to said reference potential; and,

d. means responsive to said determination for producing a transmission control signal based on such determination effective to control the solenoids of said transmission.

4,700,803

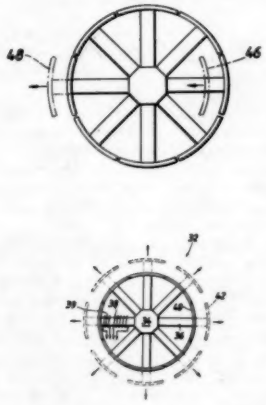
TRANSDUCER FORMING COMPRESSION AND SHEAR WAVES FOR USE IN ACOUSTIC WELL LOGGING

A. J. Mallett, and John W. Minear, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 29, 1986, Ser. No. 912,283

Int. Cl.[4] G01V *1/40, 1/143*

U.S. Cl. 181—106 **4 Claims**



1. Acoustic wave generating apparatus comprising:

(a) radially directed expansion means including N expansion means elements in number where N is an integer, and wherein said expansion means elements move radially directed outwardly and inwardly, said radial outward and inward movement being relative to a center line, and through a selected stroke length to thereby deflect an attached transducer outer face, said expansion means elements forming a stroke of selected amplitude and frequency to create an acoustic wave, wherein the acoustic wave is a compression or shear wave depending on the relative phase of operation of said expansion means when placed in a well borehole;

(b) coil means wrapped around an elongate, radially directed magnetostrictive element comprising said expansion means elements;

(c) N driver amplifiers, one being connected to each of said elements, and all are provided with a driving signal from a signal generating means to form acoustic waves dependent on the driving signal; and

(d) polarity selecting means connected to each of said amplifiers to time operation of said amplifiers and thereby time formation of acoustic waves from said transducer outer faces wherein changes in timing cause the acoustic waves to be compression or shear waves.

4,700,804

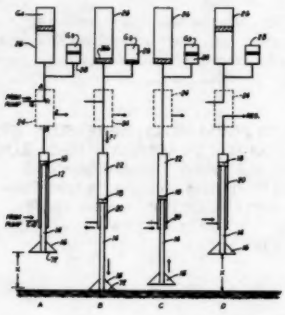
SEISMIC ENERGY SOURCE

Curtis A. Trudeau, Elk Point, S. Dak., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Dec. 30, 1985, Ser. No. 814,739

Int. Cl.[4] G01V 1/04

U.S. Cl. 181—121 **9 Claims**



1. A hyraulically actuated seismic energy apparatus for producing as single impact with the surface of the earth, including:

hyraulic means including a ram cylinder adapted to be vertically disposed above the surface of the earth, and a ram member movable relative to said ram cylinder in response in response to fluid under pressure between a first upper position and a second lower position where said ram member has face plate and impacts and compresses the earth in said lower position;

first pressure responsive means coupled to said ram cylinder for providing a defined volume of fluid at a first actuation pressure to said ram member for accelerating said ram member in a downward direction between said first and second positions until the face plate of the ram member is in proximate spaced relationship to the surface of the earth; and

second pressure responsive means coupled to said first pressure responsive means for providing a low pressure fluid chamber to receive return of fluid from said cylinder when a reaction force in the compressed earth overcomes the downward acceleration forces of the ram member at said lower position thereby accelerate said ram member in an upward direction from said lower position toward said upper position.

4,700,805

MUFFLER FOR EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE

Hideharu Tanaka; Mutsuo Sekiya, and Fusaoki Uchikawa, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

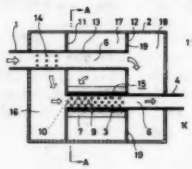
Filed Apr. 16, 1985, Ser. No. 723,990

Claims priority, application Japan, Sep. 20, 1984, 198242

The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.

Int. Cl.[4] F01N 1/10

U.S. Cl. 181—265 **10 Claims**



1. A muffler for exhaust gas of an internal combustion engine comprising,

(a) a casing having an inlet and an outlet for receiving an expelling, respectively, said exhaust gas,

(b) a cylindrical sound-absorbing body comprising,

(i) a first, perforated pipe having openings formed therein,

(ii) a cylindrical porous sound-absorbing material concentrically surrounding said perforated pipe,

(iii) and a thin film sandwiched between said perforated pipe and said sound-absorbing material.

(c) means for balancing the gas pressure between the space which is surrounded by said first perforated pipe, said thin film and said sound-absorbing material, and the space surrounding said sound-absorbing material,

(d) said cylindrical sound-absorbing body being positioned within said casing to cause said exhaust gas flowing from said inlet to said outlet to pass through said first, perforated pipe,

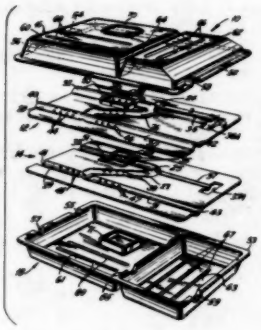
(e) at least one partition within said casing defining a plurality of gas expansion chambers, the downstream end of said first, perforated pipe communicating with said casing outlet, a plurality of small diameter holes within said at least one partition to communicate between expansion chambers on opposite sides of the at least one partition, and one of said expansion chambers forming said space surrounding said sound-absorbing material whereby; exhaust gas entering said inlet expands within said other of said expansion chambers, passes through said small diameter holes within said at least one partition prior to passage through said first perforated pipe and is further expanded within said one of said expansion chambers on the opposite side of said at least one partition whereby said small diameter holes within said at least one partition control the sound deadening performance of the muffler in the low-frequency range while the exhaust gas expanded within said one expansion chamber improves the propagation of sound waves into the sound-absorbing material, while increasing the vibration response property of the thin film to improve the sound-absorbing capability of the sound-absorbing material to ensure effective increase in the sound-absorbing properties of the muffler and thereby broaden the band width of sound absorption of the muffler.

4,700,806

STAMP FORMED MUFFLER

Jon Harwood, Toledo, Ohio, assignor to AP Industries, Inc., Toledo, Ohio

Filed Nov. 25, 1986, Ser. No. 934,642
Int. Cl.[4] F01N *1/02, 7/18*
U.S. Cl. 181—282 22 Claims



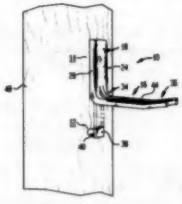
1. A muffler for mounting to at least one exhaust pipe and at least one tail pipe of a vehicle, said muffler comprising a pair of plates securely connected to each other in generally face to face relationship, each of said plates being stamp formed to define an array of channels therebetween, said channels being configured to define at least one inlet tube and at least one outlet tube in communication with one another and connectable to the exhaust pipe and tail pipe respectively, said inlet and outlet tubes each including at least one array of perforations extending therethrough, said arrays of channels further defining at least one tuning tube in communication with at least one of said inlet and outlet tubes, said muffler further comprising at least one stamp formed external shell securely mounted to said plates, said external shell being stamp formed to define: inlet and outlet openings surrounding and mounted to selected portions of said inlet and outlet tubes respectively, at least one chamber enclosing the arrays of perforations in said plates, and at least one stamp formed low frequency resonating chamber in communication with the tuning tube formed by the plates.

4,700,807

TREE STEP

Robert E. Kubiak, Robbinsville, N.J., assignor to Foxcraft, Inc., Robbinsville, N.J.

Filed Aug. 25, 1986, Ser. No. 900,288
Int. Cl.[4] A63B *27/00, 29/04*
U.S. Cl. 182—92 5 Claims



1. A tree step apparatus for use with a screw having a head portion and a shank portion having screw flights therein for screwing into a tree, said apparatus comprising:

a horizontal foot support section;

a vertical screw engaging section attached to said horizontal foot support section; and,

substantially continuous channel means for detachably engaging said screw, said channel means facing outward in the direction of said screw and including an open end and a closed end, said open end being located near the intersection of said horizontal foot support section and said vertical screw engaging section, said channel means including:

(a) a back section that extends substantially the length of said horizontal foot support section and said vertical screw engaging section;

(b) first and second sidewall sections connected to said back section and substantially vertical with respect to the plane of said back section, said first and second sidewall sections also extending substantially the length of said horizontal foot support section and said vertical screw engaging section; and,

(c) first and second keeper lip sections substantially parallel to the plane of said back section and attached respectively to said first and second sidewall sections and facing inwardly therefrom and extending at least substantially the length of said vertical screw engaging section, said first and second keeper lip sections defining a slot having a width narrower than the width of the head portion of said screw but wider than the shank of said screw,

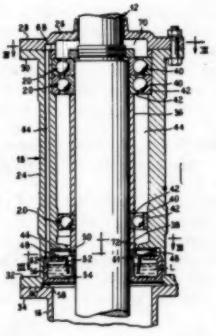
wherein said screw may be held by said vertical screw engaging section by sliding said screw into said channel means in a straight continuous motion and then subsequently screwing said screw into a tree using the horizontal foot support section as a handle and wherein said screw may be removed from said channel means by sliding said screw out of said channel means in another straight continuous motion.

4,700,808

SHAFT MOUNTED BEARING LUBRICATING DEVICE

Walter D. Haentjens, R.D. #1 - Box 121, Sugarloaf, Pa. 18249

Filed Jul. 17, 1986, Ser. No. 886,361
Int. Cl.[4] F16N *13/20*
U.S. Cl. 184—6.18 17 Claims



1. An oil recirculating device for use with bearings on a rotating vertical shaft, comprising:

means forming an oil reservoir for holding a quantity of oil;

means for drawing oil from said oil reservoir means, said drawing means a smooth ring extending into oil within said oil reservoir means and mounted coaxially of said vertical shaft to rotate with said rotating shaft;

means for pressurizing oil drawn from said oil reservoir means, said pressurizing means being mounted above said smooth ring and driven by said rotating shaft;

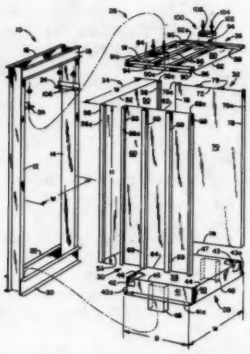
means for communicating the pressurized oil to the bearings;
means for returning oil from the bearings to at least one of said oil reservoir and said pressurizing means
whereby oil or lubricant is circulated to the bearings during rotation of the shaft.

4,700,809

SCREWLESS ELEVATOR CAR ASSEMBLY

Gustav Lazar, Vienna, Austria, assignor to Otis Elevator Company, Farmington, Conn.

Filed Apr. 18, 1986, Ser. No. 853,795
Int. Cl.[4] B66B *11/02*
U.S. Cl. 187—1 R **2 Claims**



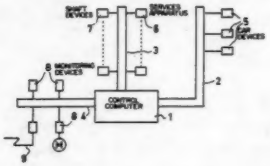
1. An elevator car (**26**) having two side panels (**60;70**), a back panel (**50**), a base panel (**38**), and a top panel (**80**), characterized in that:
the base panel (**38**) has U-shaped channels (**41*a*,42*a*,43*a*)** of width t extending around its two side edges (**45,47**) and its back edge (**46**);
the side panels (**60;70**) have regions (**66*a*;76*a*)** of thickness t extending along their back edges (**66;76**), regions (**66*a*,68*a*,69**; **76*a*,78*a*,79**) of thickness t disposed along their top edges (**62;72**), and regions (**66*a*,68*a*,69**; **76*a*, 78*a*,79**) of thickness t disposed along their bottom edges (**64;74**);
the back panel (**50**) has U-shaped channels (**56*a*,58*a*)** of width t extending along its side edges (**56,58**), regions (**56*a*,58*a*)** of thickness t disposed along its top edge (**52**), and regions (**56*a*,58*a*)** of thickness t disposed along its bottom edge (**54**);
the top panel (**80**) has U-shaped channels (**90*a*,91*a*,92*a*)** of width t extending around its two side edges (**90,92**) and its back edge (**91**);
the regions (**66*a*,68*a*,69**; **76*a*,78*a*,79**) of thickness t disposed along the bottom edges (**64;74**) of the side panels (**60;70**) and the regions **56*a*,58*a*)** of thickness t displaced along the bottome edge (**54**) of the back panel (**50**) fit snugly within the U-shaped channels (**41*a*,42*a*,43*a*)** extending around the two side edges (**45 47**) and back edge (**46**) of the base panel (**38**);
the regions (**66*a*;76*a*)** of thickness t extending along the back edges (**66;76**) of the side panels (**60;70**) fit snugly within the U-shaped channels (**56*a*,58*a*)** along the side edges (**56,58**) of the back panel (**50**);
the regions (**66*a*,68*a*,69**; **76*a*,78*a*,79**) of thickness t disposed along the top edges (**62;72**) of the side panels (**60;70**) and the regions (**56*a*,58*a*)** of thickness t disposed along the top edge (**52**) of the back panel (**50**) fit snugly within the U-shaped channels (**90*a*,91*a*,92*a*)** extending around the two side edges (**90,92**) and back edge (**91**) of the top panel (**80**);
the regions (**66*a*;76*a*)** of thickness t along the back edges (**66;76**) of the side panels (**60;70**) are U-shaped channels; and
the elevator car being mounted in a car frame (**10**) having two spaced-apart vertical beams (**12,14**) disposed on either side of the car (**26**) and two spaced-apart horizontal beams (**20,22**) disposed beneath the car (**26**), characterized in that:
two tabs (**48**) extend downward from the base panel (**38**) and fit snugly in the space between the spaced-apart horizontal beams (**20,22**).

4,700,810

METHOD OF CONTROLLING AN ELEVATOR

Matti Otala, Helsinki, Finland, assignor to Kone Elevator GmbH, Baar, Switzerland

Filed Sep. 22, 1986, Ser. No. 909,722
Claims priority, application Finland, Sep. 24, 1985, 853672
Int. Cl.[4] G05B *15/00*
U.S. Cl. 187—101 **4 Claims**



1. A procedure for entering into an elevator control computer information specific to a particular installation of an elevator provided with action means capable of data transfer, which includes employing a computer test programme to map elevators used in the particular installation and their positions;
by sending out a query round to addresses which are tabulated in the computer and which represent all action means that are possible, and by inferring the kind and number of the action means present in the installation on the basis of the answers received in the query round;
by running a test travel, during which by activating and reading the action means the location of the action means, the geometry of the building and the distances between floors are sensed; and
by storing all the information thus received which is necessary for controlling the elevator, permanently in the memory of the control computer, to enable normal operation of the elevator in the installation which is the object of the mapping.

4,700,811

METHOD FOR THE REGULATED CONTROL OF A MOVING BODY CARRYING A VARIABLE LOAD

Jean Evin, Pont a Marcq, France, assignor to Sarl Logilift, Avelin, France

Filed Mar. 24, 1986, Ser. No. 843,255
Claims priority, application France, Mar. 25, 1985, 85 04879
Int. Cl.[4] B66B *1/28*
U.S. Cl. 187—116 **9 Claims**

1. A method for the regulated control of the slowing down of a moving body carrying a variable load, more especially but not exclusively a car (**2**) of an elevator installation (**1**) for moving it along a predetermined path, whether the regulation takes place for slowing down the said moving body gradually and stopping it accurately at a given point, such as a given level (N), or for keeping it at a speed called low speed because it is less than its normal speed, in which method:
a set of possible slowing down references (**20** to **23**) is defined beforehand,
at least one magnitude (G_e) is measured representative of the

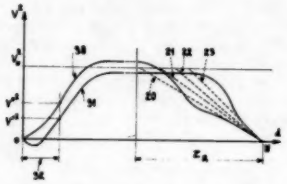
energy consumed by a motor (4) for driving the moving body over a predetermined distance (32),

for the slowing down phase of the moving body (2) one of the slowing down references is chosen from the set of possible references (20 to 23),

characterized in that:

the possible slowing down references are all of different slopes and each defined as a function of a load carried by the moving body to be slowed down,

before entering the slowing down phase, the magnitude (G_e) representative of the energy consumed by the interval of the given distance is measured,



the instantaneous speed of the moving body (2) is measured at the instant when it has traversed the interval of the predetermined distance,

the estimated load (C_e) carried by the moving body (2) is calculated based on said magnitude (G_e) representative of the energy consumed for traversing the interval of the predetermined distance and as a function of the speed attained at the end of that interval,

it is from the estimated load (C_e) that, for the entire slowing down phase of the moving body, the reference chosen from the set of references (20 to 23) is imposed as being the one suitable for the estimated load.

4,700,812

VEHICULAR SUSPENSION SYSTEM

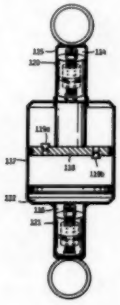
Bernd Moser, Hamm/Sieg, Fed. Rep. of Germany, assignor to Boge GmbH, Eitorf, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 864,452

Claims priority, application Fed. Rep. of Germany, May 22, 1985, 3518382

Int. Cl.[4] **F16D** *66/00*

U.S. Cl. 188—1.11 **19 Claims**



1. A suspension system, of a type including hydraulic, pneumatic, and hydropneumatic suspension systems, for a motor vehicle having suspended and unsuspended vehicle components, said suspension system comprising:

at least one sensing unit disposed in one of said vehicle components;

said at least one sensing unit comprising at least one unit for sensing a predetermined parameter of said vehicle component;

said at least one sensing unit each comprising:

a housing for being disposed within said one vehicle component;

said housing having an inertial mass disposed to move substantially freely therein;

a source of light disposed within and moving freely with said inertial mass;

means for suspending said inertial mass for substantial free movement within said housing and for permitting said inertial mass to move back and forth within said housing during use when said predetermined parameter is being measured;

means for conducting light from said light source in an interior portion of said inertial mass to an exterior portion of said inertial mass; and

said housing having photoelectric sensing means disposed therewithin to selectively receive light from said light source within said inertial mass through said light conducting means as said inertial mass moves back and forth within said housing.

4,700,813

WHEEL ASSEMBLY INCLUDING A DISC BRAKE FOR VEHICLES

Heinrich B. Rath, Vallendar, Fed. Rep. of Germany, assignor to Lucas Industries public limited company, Birmingham, England

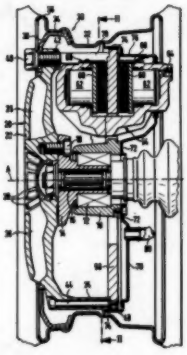
PCT No. PCT/EP85/00252, § 371 Date Jan. 28, 1986, § 102(e) Date Jan. 28, 1986, PCT Pub. No. WO85/05661, PCT Pub. Date Dec. 19, 1985

PCT Filed May 24, 1985, Ser. No. 826,487

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1984, 8417138

Int. Cl.[4] **B60T** *1/06;* **F16D** *55/02, 65/78;* **A63C** *17/12*

U.S. Cl. 188—18 A **6 Claims**



1. A wheel assembly having axially spaced inner and outer sides and a wheel web (82) fixed to a wheel hub (14) and having axially spaced inner and outer faces, said assembly including a disc brake consisting of a cup-shaped disc carrier (20) which has a base member (22) also secured to said wheel hub (14) and a drum-type member (24) extending axially inwardly at a small radial spacing from the inner surface of a wheel rim (30) and being firmly connected to the radially outer edge (48) of a brake disc (50), a brake caliper (54) supported at a stationary wheel bearing box (10) and straddling the radially inner edge of the brake disc (50), supporting brake pads (60) disposed at either side of the brake disc, and comprising an actuating device (62) at least at one side of the brake disc (50), and first vent passages (26) within the base member and spaced radially

inwardly from said wheel rim (30), said base member (22) being of double wall design to define an inner chamber which is subdivided into said vent passages (26) by ventilation blades (28) which are at least approximately radial, and second substantially radial vent passage (84) formed between said double-walled base member (22) and the inner face of said wheel web (82), said first and second vent passages having respective radial inner and outer open ends and being independent of each other whereby in operation two independent air streams (88, 90) are generated.

6. A wheel assembly including a disc brake for vehicles, comprising a cup-shaped disc carrier (20) which has a base member (22) secured to a wheel hub (14) and a drum-type member (24) extending axially inwardly at a small radial spacing from the inner surface of a wheel rim (30) and being firmly connected to the radially outer edge (48) of a brake disc (50), a brake caliper (54) supported at a stationary wheel bearing box (10), straddling the radially inner edge of the brake disc (50), supporting brake pads (60) disposed at either side of the brake disc, and comprising an actuating device (62) at least at one side of the brake disc (50), and first vent passages (26) within the base member and spaced radially inwardly from said wheel rim (30), said base member (22) being of double wall design to define an inner chamber which is subdivided into said vent passages (26) by ventilation blades (28) which are at least approximately radial, wherein said disc carrier (20) together with the wheel rim (30) and an axially inner wall (70) fixed to the wheel bearing box (10) define a space which contains the brake disc (50) and at least a substantial part of the brake caliper (54) and is connected to a vent pipe (80), said axially inner wall (70) including a collar (74) which encloses the radially outer edge (48) of the brake disc (50) and the adjoining area of the drum-type member (24), and forms a heat barrier with respect to said inner surface of said wheel rim (32).

4,700,814

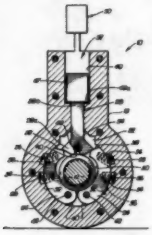
LOCKING DEVICE FOR RECIPROCATING MEMBERS

William D. Mitchell, Orange, Calif., assignor to Chalco Engineering Corporation, Gardena, Calif.

Filed Nov. 27, 1984, Ser. No. 675,418

Int. Cl.[4] B65H *59/10*

U.S. Cl. 188—67 **8 Claims**



1. A locking device for securing a reciprocating member having at least one circumferentially disposed groove located at any preselected position, said locking device comprising:

a housing having a bore engaging said reciprocating member;

at least one curved locking element disposed within said housing bore adjacent said reciprocating member for engaging said reciprocating member circumferential groove;

at least one biasing means, disposed through said housing bore, for forcing said locking element towards said reciprocating member;

release means, disposed within said housing, for disengaging said locking element from said reciprocating member circumferential groove, wherein locking is effectuated by engagement of said locking element with said reciprocating member circumferential groove, said release means comprising a release element slidingly disposed within said housing and generally limited to movement along an axis generally perpendicular to the longitudinal axis of said reciprocating member, said release element selectively engaging said locking element such that displacement of said release element towards said reciprocating member pivotally displaces said locking element away from said reciprocating member;

said locking device further comprising:

a retention element, disposed within said housing through a bore generally parallel to the longitudinal axis of said reciprocating member, said retention element having a first surface for selectively engaging said release element and retaining said release element in proximity to said reciprocating member, wherein engagement of said retention element and said release element prevents said locking element from engaging said reciprocating member circumferential groove.

4,700,815

VEHICLE SUSPENSION SYSTEM

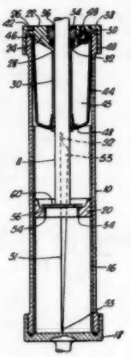
Gunter Persicke, Gwynedd; James R. Child, Clwyd, and Peter F. Baker, Gwynedd, all of Wales, assignors to Quinton Hazell plc, Clwyd, Wales

Filed Jan. 16, 1985, Ser. No. 691,881

Claims priority, application United Kingdom, Jan. 20, 1984, 8401491

Int. Cl.[4] F16F *9/34*

U.S. Cl. 188—286 **7 Claims**



1. Vehicle suspension apparatus including damper means in the form of a piston and cylinder device, which apparatus comprises:

(1) a cylinder member containing fluid, said cylinder member being closed at a first end,

(2) compressible gas in a chamber located at an end of said cylindrical member opposite said first end and forming an axial extension of said cylindrical member whereby said compressible gas acts on the fluid in said cylindrical member to apply a variable pressure on the fluid during relative movement of the piston to control the damping characteristics,

(3) a piston located within said cylindrical member and a piston rod connected to the piston and extending outside said cylindrical member, said piston and cylindrical member being relatively movable in a first direction to elongate the piston and cylinder device and relatively movable in a second opposie direction to shorten the piston and cylinder device, and

(4) fluid passage means to permit fluid flow past the piston

during relative movement of the piston and cylindrical member, said fluid passge means comprising:

(a) a first fluid flow passage which is bidirectional and adjacent the piston to control pressure differential across the piston, said first fluid flow passage including an elongated slot extending longitudinally along the cylindrical member between the piston and cylinder, the slot having a cross-section which varies along the length of the slot to suit the required damping characteristics and being closed at one end to prevent fluid passage, and

(b) a second fluid flow passage together with valve means to provide differential resistance with valve means to provide differential resistance to relative movement of the piston in opposite directions, said valve means permitting no fluid flow during relative movement in said first direction to lengthen the piston and cylinder device, whereby said slot provides an hydraulic stop when the piston and cylinder device is fully extended.

4,700,816

DRUM BRAKE INCLUDING THREE BRAKE SHOES

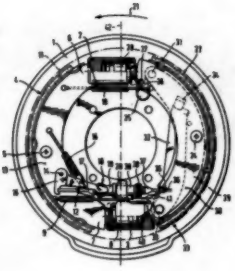
Heinrich-Bernhard Rath, Vallendar, Fed. Rep. of Germany, assignor to Lucas Industries public limited company, Birmingham, England

Filed May 13, 1986, Ser. No. 862,657

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 8514496[U]

Int. Cl.⁴ F16D *51/34*

U.S. Cl. 188—323 **4 Claims**



1. A drum brake for a vehicle wheel comprising first, second and third brake shoes, means for hydraulically actuating two of said brake shoes but not said third shoe, and means for mechanically actuating one of said first two shoes and said third shoe, but not the other of said first two shoes, means for supporting said first two shoes so that upon hydraulic actuation both are trailing shoes when said wheel is travelling in a forward direction, and means for supporting said one of said first two shoes and said third shoe so that upon mechanical actuation in the forward direction of wheel travel one of the last mentioned shoes is a trailing shoe and the other a leading shoe, and vice versa in the backward travel of said wheel.

4,700,817

DYNAMIC VIBRATION ABSORBER WITH SPRING-SUPPORTED PENDULUM

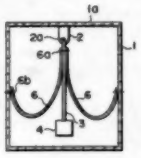
Kiyoshi Kondo; Fukuhiko Katsoka, both of Tsu, and Kiyotaka Uno, Hisai, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1986, Ser. No. 874,486

Claims priority, application Japan, Jun. 27, 1985, 60-141190; Jun. 27, 1985, 60-141191; Jun. 27, 1985, 60-141193

Int. Cl.⁴ F16F *7/10, 1/00;* F16M *1/00*

U.S. Cl. 188—380 **6 Claims**



1. A dynamic vibration absorber with a spring-supported pendulum, comprising:

a weight suspension shaft swingably suspended from a central portion of a top plate of a frame;

a weight attached to the weight suspension shaft;

a pair of generally U-shaped leaf springs, said leaf springs having first ends which are attached to the weight suspension shaft so as to be symmetrical with respect to the weight suspension shaft, said first ends being attached to the weight suspension shaft in the vicinity of a pivotal point on the weight suspension shaft, and said leaf springs having second ends which are attached to an inner wall surface of the frame at positions below the first ends; and

said weight being adjustably attached to the weight suspension shaft so as to be adjustable in vertical position on said weight suspension shaft.

4,700,818

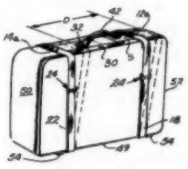
STRAP DEVICE FOR REINFORCING LUGGAGE AND THE LIKE

John P. Orwin, 31439 Alcona, Westland, Mich. 48185

Filed May 16, 1986, Ser. No. 863,982

Int. Cl.⁴ A45C *13/30;* B65D *63/00*

U.S. Cl. 190—27 **22 Claims**



2. A strap device for reinforcing luggage, bags, cartons or the like comprising;

a pair of first, spaced strap means for encircling a piece of luggage or the like, said first strap means adapted to extend along a first pair of opposed side of a protruding handle on a luggage piece;

a pair of croas strap means secured at spaced positions on and extending between said first strap means for holding said first strap means together, said cross strap means adapted to extend along a second pair of opposed sides of the protruding handle of a luggage piece or the like;

each of said first strap means and cross strap means being formed from flexible, stretch resistant material;

securing means on at least one end of each of said first strap

means for securing the respective ends of said first strap means to one another to encircle and reinforce a luggage piece or the like; said securing means including a mechanical securing device; the opposite ends of said first strap means including hook and loop fastener means for securing said opposite ends to another portion of said first strap means after passing through said mechanical securing device; said cross strap means and the portions of said first strap means between said spaced cross strap means forming confining means for surrounding and receiving therein the protruding handle on the luggage piece or the like to prevent said strap device from sliding or being pulled off the luggage piece when said first strap means are secured around the luggage piece with said securing means.

16. The combination of a piece of luggage of the type including a handle protruding from one surface thereof and a strap device for reinforcing said luggage against opening, said strap device comprising:

a pair of first, spaced strap means for encircling said luggage, said first strap means adapted to extend along a first pair of opposed sides of a protruding handle on said luggage piece;

a pair of cross strap means secured at spaced positions on and extending between said first strap means for holding said first strap means together, said cross strap means adapted to extend along a second pair of opposed sides of said protruding handle;

each of said first strap means and cross strap means being formed from flexible, stretch resistant material;

securing means on at least one end of each of said first strap means for securing the respective ends of said first strap means to one another to encircle and reinforce said luggage piece;

the opposite end of each of said first strap means including second securing means for securing said opposite end to another portion of said first strap means after securing with the first of said securing means;

said cross strap means and the poritons of said first strap means between said spaced cross strap means forming confining means for surrounding and receiving therein said protruding handle on said luggage piece to prevent said strap device from sliding or being pulled off said luggage piece when said first strap means are secured around said luggage piece with said securing means.

4,700,819

METHOD OF CONTROLLING TRANSMISSION CAPACITY OF A DIRECT-COUPLING MECHANISM IN HYDRAULIC POWER TRANSMISSION MEANS OF AN AUTOMATIC TRANSMISSION FOR AUTOMOTIVE VEHICLES IN ACCORDANCE WITH VEHICLE OPERATION MODE

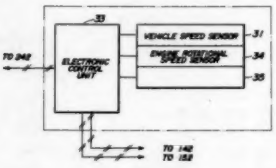
Masao Nishikawa, Nerima; Junichi Miyake, Iruma; Yoshimi Sakurai, Tanashi, and Yukihiro Fukuda, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1986, Ser. No. 872,969

Claims priority, application Japan, Jun. 13, 1985, 60-129524; Mar. 3, 1986, 61-46976

Int. Cl.[4] F16D *31/08*; B60K *41/22*

U.S. Cl. 192—3.62 **12 Claims**



1. A method of controlling a direct-coupling mechanism of hydraulic power transmission means having an input member and an output member, of an automatic transmission for an automotive vehicle, said direct-coupling mechanism being operable to mechanically engage and disengage said input member and said output member with and from each other, said automatic transmission having selector means being operatable at human will to select among a plurality of operating modes in which said automotive vehicle is to be operated, wherein the transmission capacity of said direct-coupling mechanism is controlled such that the value of a first predetermined parameter indicative of an amount of relative slip between said input member and said output member lies within a predetermined reference range, the method comprising the steps of: (1) detecting the value of a second predetermined parameter indicative of one of said operating modes selected by said selector means; and (2) determining said predetermined reference range of the value of said first predetermined parameter in dependence on the detected value of said second predetermined parameter.

4,700,820

TORQUE TRANSFER DEVICE AND ENGAGEABLE, SHIFTABLE CLUTCH IN AN ALL-WHEEL DRIVE ARRANGEMENT FOR A MOTOR VEHICLE

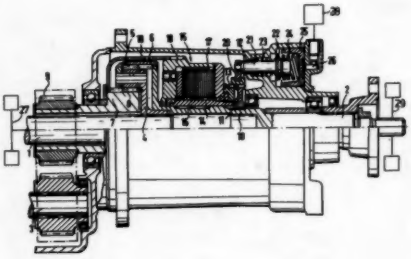
Udo Hickmann, Muehlacker, and Guenter Ruehle, Bietigheim-Bissingen, both of Fed. Rep. of Germany, assignors to Dr. Ing. H.c.f. Porsche AG, Weissach, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,560

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3514947

Int. Cl.[4] F16D *47/06*

U.S. Cl. 192—48.5 **13 Claims**



1. A four wheel drive arrangement for a motor vehicle driven by an internal-combustion engine having a first and a second axle, said arrangement comprising:

torque transfer means arranged in a drive line of said first and second axles, said torque transfer means providing a torque transfer between said axles as a function of a speed difference between said axles, and

engageable shiftable clutch means connected to said internal-combustion engine and coupled to said torque transfer means for disengaging said torque transfer means from said drive line of said first and second axle,

wherein said engageable clutch means is engaged and disengaged as a function of the operation of said internal-combustion engine.

4,700,821

CLUTCH PLATE

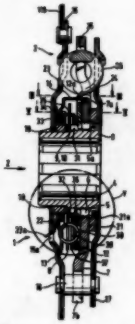
Paul Maucher, Sasbach, and Rudolf Hönemann, Ottersweier, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Nov. 18, 1985, Ser. No. 799,007

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442717

Int. Cl.[4] F16D *3/66*

U.S. Cl. 192—106.2 28 Claims



1. A clutch plate, particularly for use in the friction clutches of motor vehicles, comprising coaxial rotary input and output components having limited freedom of angular movement relative to each other; a first damping unit interposed between said components to oppose a first stage of said angular movement and including coaxial rotary input and output elements and first energy storing means interposed between said elements to yieldably oppose their rotation relative to each other; a second damping unit interposed between said components to oppose at least a part of the remaining stage of said angular movement and including coaxial rotary input and output members and second energy storing means interposed between said members to yieldably oppose their rotation relative to each other; and at least one load friction generating device which is interposed between the elements of said first damping unit and generates friction only within an advanced portion of said first stage, said device including at least one part having a portion cooperating with said first energy storing means, said part of said load friction generating device being rotatable with reference to the input and output elements of said first damping unit.

4,700,822

TORSION DAMPING ASSEMBLY FOR CLUTCH PLATES

Paul Maucher, Sasbach, and Rudolf Hönemann, Ottersweier, both of Fed. Rep. of Germany, assignors to LUK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

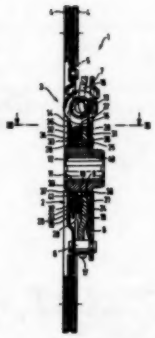
Continuation of Ser. No. 801,565, Nov. 25, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 931,943

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442705

Int. Cl.[4] F16D *3/14*

U.S. Cl. 192—106.2 26 Claims

1. In a torque transmitting device, particularly in a clutch plate for use in the friction clutch of a motor vehicle, a torsion damping assembly comprising an input component and a substantially hub-shaped coaxial output component; a first torsion damping stage having coaxial input and output elements rotatable relative to each other within first limits, and first energy storing means interposed between said elements to oppose their rotation relative to each other with a first force; a second torsion damping stage having an input member, a flange-like output member coaxial with and rotatable relative to said input member within second limits, and second energy storing means interposed between said members to oppose their rotation relative to each other with a second force, said input element comprising two spaced-apart coaxial plates secured to said output member, said plates having registering windows and said first energy storing means having portions in said windows, one of said plates abutting directly against said output member and said output element comprising a flange which is non-rotatably secured to said output element and has windows for said portions of said first energy storing means, said flange being disposed between said plates, said output member being coaxially mounted on said output component with an angular play and said input component comprising two axially spaced-apart coaxial discs flanking said output member, said first stage being disposed between said output member and one of said discs; and form-locking means for non-rotatably connecting said plates to said output member.



4,700,823

CLUTCH WITH PYROLYTIC CARBON FRICTION MATERIAL

Peter S. Winckler, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 28, 1980, Ser. No. 134,842

Int. Cl.[4] F16D *13/64, 69/02*

U.S. Cl. 192—107 M 44 Claims

7. In a clutch or brake device including at least two members mounted for relative rotation, each member having a friction surface rotatable therewith and confronting each other, means to frictionally engage said confronting surfaces to retard said relative rotation, and a cooling liquid in contact with said confronting surfaces, the improvement comprising:

a pyrolytic carbon composite friction material defining at least one of said confronting surfaces, said friction material including

a meshed cloth substrate having a discernible surface texture formed of carbon fibers, and

a coating of carbon deposited on said fibers by chemical

vapor deposition to a level forming a friction material having a relatively open mesh with the surface texture of said substrate being substantially the same after said coating is applied.

15. In a clutch or brake device including at least two members mounted for relative rotation, each member having a friction surface rotatable therewith and confronting each other, and means to frictionally engage said confronting surfaces to retard said relative rotation, the improvement comprising:

a pyrolytic carbon composite friction material defining at least one of said confronting surfaces, said friction material including

a meshed circuit substrate having a discernible surface texture formed of carbon fibers, and

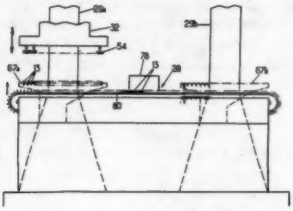
a coating of carbon deposited on said fibers by chemical vapor deposition to a level forming a friction material having a relatively open mesh with the surface texture of said substrate being substantially the same after said coating is applied.

4,700,824

MANUFACTURING INSTALLATION WITH SEVERAL FIXED WORK POSTS AND A HANDLING DEVICE

Bernard Vere, Eybens, and Paul Mathevon, Bollene, both of France, assignors to Societe Cogema, Framatome et Uranium Pechiney, Velizy, France

Filed Dec. 28, 1984, Ser. No. 687,344
Claims priority, application France, Dec. 30, 1983, 83 21126
Int. Cl.[4] B65G *47/14*
U.S. Cl. 198—346.2 **6 Claims**



1. A manufacturing installation comprising a plurality of work stations for successively processing identical objects having a general external elongate shape with remains unchanged during manufacture, wherein said work stations are disposed along at least one handling bay and said installation comprises a handling device having

(a) an overhead transporter movable along the handling bay and having means for engaging, transporting and laying down a predetermined plurality of said objects at a time; and

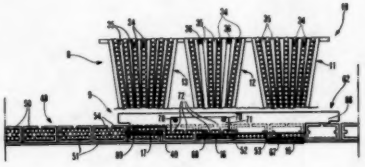
(b) an intermediate take-up and storage device confronting each of said work stations, having an upstream station for receiving said objects laid down by the transporter, a downstream station for receiving said objects to be taken up by the transporter, said upstream station and downstream station being at a fixed position along the direction of the movement of said transporter and located under the path of said transporter along the bay, and conveyor means arranged for grasping said plurality of objects as a whole at the upstream station, presenting the objects one by one at the work station and presenting them as a whole at said downstream station, said upstream and downstream stations being vertically movable, so as to completely uncouple the operation of the transporter from each work station.

4,700,825

METHOD FOR FORMING INCOMPLETE GROUPS OF CIGARETTES IN A CIGARETTE PACKETING MACHINE

Riccardo Mattei, Bologna, and Marco Brizzi, Zola Predosa, both of Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

Filed Jun. 12, 1985, Ser. No. 744,034
Claims priority, application Italy, Jun. 22, 1984, 3500 A/84
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—419 **9 Claims**



1. A method for forming, in a cigarette packing machine, incomplete groups of cigarettes each adapted to fill an inner space of a respective packet and comprising at least two layers of side-by-side cigarettes, one of said two layers being an incomplete layer lacking at least one intermediate cigarette, and the other of said two layers being a complete layer, and being arranged above said incomplete layer; each cigarette of said incomplete layer being arranged in contact with two cigarettes of said complete layer, and being staggered by half a diameter in relation to said two contacting cigarettes;

the method comprising the steps of:

arranging said incomplete layer;

axially feeding the cigarettes of said incomplete layer into casing means defining a space equal to said inner space and advancing stepwise along a path extending transversely to said cigarettes; said cigarettes of said incomplete layer being fed into said casing means during a first halt thereof in a first feed position, and until said cigarettes of said incomplete layer come axially into contact with first axial stop means;

causing said casing means to undergo a second halt in a second feed position so that each cigarette of said incomplete layer stops with a terminal portion of cigarettes below guide means for the insertion of said upper complete layer, said guide means being arranged at said second feed position;

arranging said complete layer;

axially feeding the cigarettes of said complete layer above said guide means and into said casing means until they come axially into contact with second axial stop means, said second axial stop means being arranged rearwardly of said first axial stop means, in a direction of said axial feeding of said cigarettes, by a distance at least equal to the length of said terminal portion covered by said guide means, so that, when in contact with said second axial stop means, said cigarettes of said complete layer lie in said staggered relationship on top of, and extend partially beyond, said cigarettes of said incompete layer;

advancing said casing means from said second feed position so as to uncover said terminal portion of the cigarettes of said incomplete layer; and

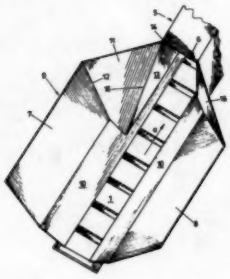
causing the cigarettes of said complete layer and of said incomplete layer to undergo a relative axial displacement so as to completely superpose said layers one on the other.

4,700,826

DEVICE FOR CONVEYING HEAPS OF DEBRIS

Helmut Trapp, Stainach, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 9, 1986, Ser. No. 905,265
Claims priority, application Austria, Sep. 12, 1985, 2673/85
Int. Cl.[4] B65G *65/34*
U.S. Cl. 198—550.12 9 Claims



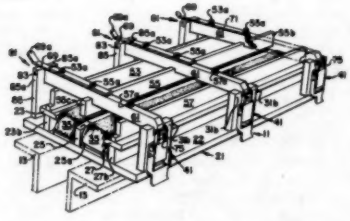
1. Device for conveying lumpy material, in particular a heap of debris resulting when mining minerals, by means of a chain conveyor, belt conveyor or the like, noting that the conveyor is passed through a channel having a width approximately corresponding to the width of the conveyor and is guided before the channel, as seen in conveying direction, between inclined walls laterally extending beyond the width of the conveyor and noting that before the ingress location into the channel there are arranged inclined deflection walls, characterized in that at one side of the conveyor there is arranged an obliquely ascending deflection wall (11) in transverse direction to the conveying direction (a), said deflection wall including, as seen in a vertical section extending in parallel relation to the conveying direction (a), with the plane of the conveyor (1) an angle (α), being open in opposite direction to the conveying direction (a), of more than 90° and having adjoined thereto an approximately vertical wall (13) extending in parallel relation to the conveying direction (a) and passing over into the channel (5).

4,700,827

VIBRATORY FEEDER ARRANGEMENT

Michael J. Haaser, Baltimore, Md., assignor to Advanced Manufacturing Systems, Incorporated, Sparks, Md.

Filed Jul. 2, 1984, Ser. No. 626,774
Int. Cl.[4] B65G *27/00*
U.S. Cl. 198—771 51 Claims



1. A vibratory feeder for use in a vibratory conveyor having a means to impart vibratory feed motion, said vibratory feeder comprising:

jointly vibratable top and bottom segments which together form a feed zone for parts to be fed therethrough,

said top and bottom segments being hinged together through a hinge connection therebetween,

force-applying closure-securing means for applying a closure force and securing action at a position spaced from said hinge connection to effect secured effective closure of said top and bottom segments together for vibratory feeding operation thereby,

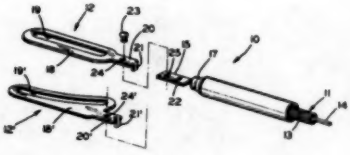
and zero-lash-effecting means for effecting a zero lash in the hinge connection in the effectively closed position of said hinged together and bottom segments as a function of hinged angular relative closure movement thereof together.

4,700,828

MULTI-CLEVIS CABLE CONNECTOR

Wendell C. Lane, Jr., Laurinburg, N.C., assignor to Dana Corporation, Toledo, Ohio

Filed Jul. 18, 1986, Ser. No. 886,602
Int. Cl.[4] B65D *85/00*
U.S. Cl. 206—223 18 Claims



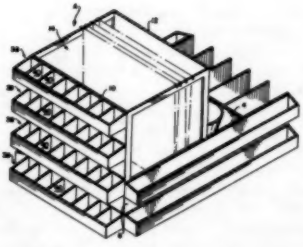
1. A throttle cable comprising a control wire having an end portion, a first connector affixed to said end portion, and a plurality of clevises of differing configurations, each of said plurality of clevises including a second connector, each said second connector being adapted to mate with said first connector whereby any selected one of said plurality of clevises may be affixed to said control wire.

4,700,829

OFFICE ORGANIZER FOR DESKS

Nelson Goodyear, Space 23 Regency Villa, 15111 Bushard, Westminster, Calif. 92683

Filed Apr. 6, 1987, Ser. No. 34,909
Int. Cl.[4] B43M *17/00*
U.S. Cl. 206—214 14 Claims



1. A desk organizer assembly comprising:

(A) A receptacle having a base, a front, a rear and sides including front, rear and side walls.

(B) Said front, rear and side walls connected to said base;

(C) An intermediate wall positioned between said front and rear walls and of a height substantially equal to said rear

wall and connected to said side walls to form with said rear wall and said base a first container;

(D) A series of partitions extending forwardly of said front wall and supported by said base and being in height substantially equal to said front wall;

(E) Said intermediate wall connected to said side walls and forming with said front wall and said base a second container of a height less than said first container;

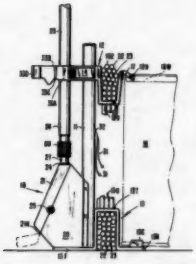
(F) Said partitions extending parallel to said side walls and forming with said front wall, said base and said side walls a series of open ended pockets extending from said front.

4,700,830

PAINT ROLLER AND HOSE CADDY ASSEMBLY

Lawrence B. O'Brien, Carmel, Ind., assignor to Triune Automated Painting Systems, Carmel, Ind.

Filed Dec. 19, 1985, Ser. No. 811,112
Int. Cl.[4] B65D *83/00, 85/02*
U.S. Cl. 206—229 **13 Claims**



1. A paint roller caddy assembly comprising:
a post;
a paint roller receiver at said post;
a bracket on said post above said receiver;
a hose storage hook on said bracket for wrapping hose thereon; and
paint can attachment means on said bracket to attach said assembly to a paint can.

4. A paint roller caddy assembly comprising:
a post;
a paint roller receiver at said post;
a bracket on said post above said receiver;
a hose storage hook on said bracket for wrapping hose thereon; and
a post base secured to said post, and having hose storage means spaced from said hook;
said bracket being slidable along said post to change the distance between the hook and the hose storage means on the base.

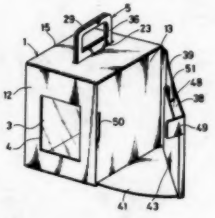
7. A paint roller caddy assembly comprising:
a post;
a paint roller receiver at said post;
a bracket on said post above said receiver;
a hose storage hook on said bracket for wrapping hose thereon;
the roller receiver including a pocket to fittingly receive a paint roller, said pocket having a front wall and a back wall, said post being at the back wall;
and said roller receiver pocket having a lid to close the pocket and cover the roller in the pocket and exclude air; and
roller handle extension clip means on said bracket and including a yoke for reception of a roller handle extension therein.

4,700,831

COMPARTMENTED PACKAGING BOX FOR COMMODITY AND ACCESSORY

Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Feb. 7, 1986, Ser. No. 827,354
Claims priority, application Japan, Mar. 25, 1985, 60-60428
Int. Cl.[4] B65D *5/46, 5/52*
U.S. Cl. 206—232 **14 Claims**



1. A packing box, comprising a plurality of outer lateral wall members, an upper end wall member and a lower end wall member together forming a prismatic box body, said packaging box further including door-type wall means forming a bag portion having an opening in its top, connecting means operatively hinging said door-type wall means to one of said outer lateral wall members of said box body for enclosing said bag portion between said door-type wall means and said box body, said door-type wall means including an extension bottom member connected to a lower edge of said door-type wall means, said extension bottom member extending approximately in a plane in which said lower end wall member of said box body extends, and means for inserting said extension bottom member into said box body for substantially positioning said extension bottom member on said lower end wall member and for closing said bag portion at its bottom.

8. A packaging box comprising a prismatic box body including a plurality of outer lateral wall members including a first lateral wall member **(11)** with a fitting slot **(50)** and a second lateral wall member **(14)** with a width dimension larger than a given width dimension of any other of said plurality of outer lateral wall members, an upper end wall member and a lower end wall member, further door-type wall means forming a bag portion having an opening in its top, hinging means operatively connecting said further door-type wall means to said second outer lateral wall member having said larger width dimension, said larger width dimension providing a spacing between said box body and said further door-type wall means, said spacing providing said bag portion enclosed between said further door-type wall means and said first outer lateral wall member **(11)** having said fitting slot, said packaging box further comprising a flap **(49)** formed on a free end edge of said further door-type wall means for insertion into said fitting slot to maintain a closed state of said further door-type wall means when said insertion flap is received in said fitting slot, said insertion flap having a length sufficient for bridging said spacing and for said insertion.

4,700,832

PACKING BRACE WITH INTERLOCKING MEMBERS

David M. Champ, Pawcatuck, Conn., assignor to United Foam Plastics Corp., Georgetown, Mass.

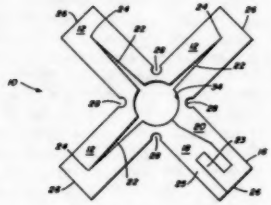
Filed Sep. 29, 1986, Ser. No. 912,981
Int. Cl.[4] B65D *81/06*
U.S. Cl. 206—320 **10 Claims**

1. A collapsible packing brace for securing the agitator basin and agitator arm of a washing machine, comprising
a generally circular non-continuous central collar;
at least two generally rectangular integral support arms,

each having a unitary construction and being integral with an outer wall of said collar;

a generally rectangular latching arm extending radially from said collar, said latching arm being formed by the interlocking engagement of male and female elongate members; and

a plurality of integral, semi-circular hinge means disposed on the outer wall of said brace between each of said arms.



4,700,833

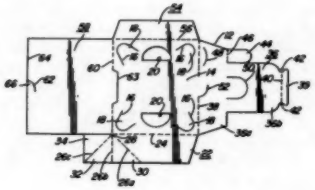
SUTURE WINDING CARD

Andrea Smith, Shillington, Pa., assignor to Sharpoint L.P., Reading, Pa.

Filed Feb. 7, 1986, Ser. No. 827,358

Int. Cl.[4] A61B *17/04*; A61L *17/00*

U.S. Cl. 206—380 **21 Claims**



1. A suture winding card comprising:

a base panel for receiving a suture winding,

at least one flap extending from an edge of said base panel and foldable over said base panel,

said flap including a pocket on said flap,

said pocket comprising three triangularly shaped foldable portions of said flap disposed in adjacent relation, said flap portions being defined by three fold lines each of which is disposed at a 45° angle to the adjacent fold line, said three fold lines intersecting at a common point at an edge of said flap, said foldable flap portions being selectively foldable to define a closed sided pocket having a pocket opening for receiving the end of a suture needle.

4,700,834

PRODUCT FOR PREVENTING YARN TAIL BREAKAGE DURING YARN WINDING

Antonio Martinez, Gastonia, N.C., assignor to Conitex, Inc., Gastonia, N.C.

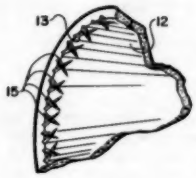
Filed Nov. 15, 1985, Ser. No. 798,599

Int. Cl.[4] B65D *85/00*

U.S. Cl. 206—388 **9 Claims**

1. In a tubular textile yarn package of the type held by at least one end thereof in contact with a rotatably mounted plate, which plate fits into the one end of the package and traps across the end of and against an inner wall of the package a length of yarn to form a yarn tail, the improvement which comprises:

yarn protection means formed on the inner wall of the package proximate to the one end of the package for gripping the yarn at at least one point thereon in the area of contact between the package and the plate to prevent breakage of the yarn by relative movement between the package and the plate occasioned by starting or stopping the rotation of the package;



said yarn protection means comprising a substantially spirally extending groove formed in the inner wall of said package adjacent to the end of said package and adapted to receive a length of the yarn therein.

4,700,835

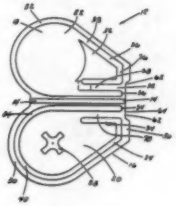
ONE-PIECE THERMOFORMED DISPENSING PACKAGING

Albert J. Rognsvoog, Jr., 4135 Harvest La., Racine, Wis. 53402

Filed May 23, 1986, Ser. No. 866,342

Int. Cl.[4] B65D *85/671*

U.S. Cl. 206—411 **19 Claims**



1. In a thermoformed plastic package, the improvement comprising:

a single piece of formed plastic sheeting folded upon itself along a hinge dividing the piece into back and front sections;

the back and front sections having (a) spaced portions forming an enclosure, and (b) contacting portions including back and front main flat areas, respectively, and interlocked back and front mating areas projecting from their respective main flat areas; and

the mating areas having interlocked undercut male and female configurations extending from a first position near the hinge around the enclosure to a second position near the hinge and spaced from the first position;

whereby the sections are firmly held together.

4,700,836

UNIVERSAL CASE FOR TRANSPORTING BOTTLES

Roy Hammett, Tampa, Fla., assignor to International Container Systems, Inc., Tampa, Fla.

Continuation of Ser. No. 761,466, Aug. 1, 1985, abandoned. This application Sep. 15, 1986, Ser. No. 908,931

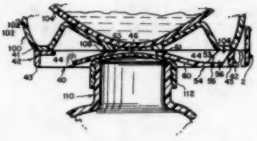
Int. Cl.[4] B65D *1/24, 21/02, 71/00, 75/00*

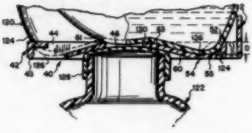
U.S. Cl. 206—427 **9 Claims**

1. A universal case for transporting PET bottles of a base-cup type and of a petaloid type, each type of PET bottle being generally symmetric in shape with a longitudinal symmetry

axis and having a closure generally centered with respect to the symmetry axis for sealing the bottle, the PET bottle of the base-cup type having a base cup with an underside shaped to permit the bottle to stand upright on a flat horizontal surface, the underside of the base cup including a base-cup-bottle central base surface and an annular bottom surface located radially outwardly of the central base surface and in a position to contact the surface on which the bottle stands, the base-cup-bottle central base surface and the annular bottom surface being approximately coplanar with respect to one another and substantially centered with respect to the symmetry axis of the bottle, the PET bottle of a petaloid type having a plurality of petaloid lobes formed in a base of the bottle shaped to permit the bottle to stand upright on a flat horizontal surface, the lobes being disposed generally symmetrically about the symmetry axis of the bottle, undersides of the petaloid lobes being substantially coplanar with respect to one another to form lobe bottom surfaces for contacting the surface on which the bottle stands, the lobe bottom surfaces defining a petaloid bottle support plane, the base of the petaloid bottle having a petaloid-bottle central base surface located generally radially inwardly of the petaloid lobes and offset along the symmetry axis of the bottle from the petaloid bottle support plane by a petaloid-bottle central-base-surface clearance distance, the case being molded from a plastic material and comprising:

(a) an outer shell;





(b) a plurality of support elements connected to and generally disposed within the outer shell for reinforcing the shell, the outer shell and support elements being shaped to define a plurality of bottle pockets for receiving the bases of PET bottles, the number of bottle pockets defining a case-bottle-capacity number, a pocket centerline being defined to extend generally centrally through each bottle pocket;

(c) a case-bottle-capacity number of bottle seeating means for seating a bottle inserted into a bottle pocket, each bottle seating means being associated with a bottle pocket and being connected to at least one of the outer shell and the support elements and including:

(c.1) base-cup-bottle alignment means for orienting a PET bottle of the base-cup type seated in the bottle pocket so that the longitudinal symmetry axis of the bottle extends generally parallel to the pocket centerline of the bottle pocket, the base-cup-bottle alignment means having a base-cup-bottle annular-bottom-surface contact surface oriented generally normal to the pocket centerline and disposed to contact the annular bottom surface of the base cup of the bottle to orient the bottle, the base-cup-bottle annular-bottom-surface contact surface defining a base-cup-bottle annular-bottom-surface contact plane; and

(c.2) petaloid-bottle alignment means for orienting a PET bottle of the petaloid type seated in the bottle pocket so that the longitudinal symmetry axis of the bottle extends generally parallel to the pocket centerline of the bottle pocket, the petaloid-bottle alignment means having a plurality of petaloid-bottle lobe-bottom-surface contact surfaces, the petaloid-bottle lobe-bottom-surface contact surfaces being substantially coplanar with one another to define a petaloid-bottle lobe-bottom-surface contact plane, the petaloid-bottle lobe-bottom-surface contact plane being oriented generally normal to the pocket centerline, the petaloid-bottle lobe-bottom-surface contact surfaces being disposed generally symmetrically about the pocket centerline at locations to register with and contact the lobe bottom surfaces of the bottle to orient the bottle, the petaloid-bottle lobe-bottom-surface contact plane being below the base-cup-bottle annular-bottom-surface contact plane when the case is in a horizontal rest position and spaced apart from the base-cup-bottle annular-bottom-surface contact plane by a distance approximately equal to the petaloid-bottle central-base-surface clearance distance;

(d) a case-bottle-capacity number of case rests, each case rest being associated with a bottle pocket, the case rest being connected to the bottle seating means associated with the bottle pocket, the case rest being generally symmetrically located with respect to the pocket centerline, each case rest having a central-base-surface bottle-to-case load-transmission surface and a case-to-closure load-transmission surface, the central-base-surface bottle-to-case load-transmission surface facing the bottle pocket and being located in approximately the base-cup-bottle annular-bottom-surface contact plane in a position to contact the central base surface of a PET bottle of the base-cup type or the petaloid type seated in the bottle pocket, the case-to-closure load-transmission surface of the case rest being generally spaced apart from the central-base-surface bottle-to-case load-transmission surface in a direction generally parallel to the pocket centerline directed away from the bottle pocket, the case rest being configured to locate a closure of a bottle oriented generally coaxially with the pocket centerline such that a top surface of the closure contacts the case-to-closure load-transmission surface, so that cases of bottles can be stacked one on top of the other with the case rests of an upper case resting on the closures of the bottles of a lower case with the case-to-closure load-transmission surfaces of the case rests contacting the tops of the closures and with the central base surfaces of PET bottles of either the base-cup type or the petaloid type in the pockets of the upper case contacting the central-base-surface bottle-to-case load-transmission surfaces of the case rests so that weight tends to be transmitted from a central base surface of a bottle in an upper case substantially directly compressively through a case rest to the top of a closure of a bottle in a lower case.

4,700,837

UNIVERSAL BOTTLE CASE

Roy Hammett, Tampa, Fla., assignor to International Container Systems, Inc., Tampa, Fla.

Continuation of Ser. No. 798,762, Nov. 15, 1985, abandoned.
This application Sep. 15, 1986, Ser. No. 908,882
Int. Cl.[4] B65D *1/24, 21/02, 71/00, 75/00*
U.S. Cl. 206—427 **8 Claims**

1. A universal case for transporting PET bottles of a base-cup type and of a petaloid type, each type of PET bottle being generally symmetric in shape with a longitudinal symmetry axis and having a closure generally centered with respect to the symmetry axis for sealing the bottle, the PET bottle of the base-cup type having a base cup with an underside shaped to permit the bottle to stand upright on a flat horizontal surface, the underside of the base cup including a generally annular bottom surface and a generally annular base-cup indentation located radially inwardly of the annular bottom surface, the annular bottom surface being located in a position to contact the surface on which the bottle stands, the annular bottom

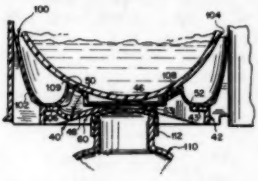
surface and the annular base-cup indentation being substantially centered with respect to the symmetry axis of the bottle, the PET bottle of a petaloid type having a plurality of petaloid lobes formed in a base of the bottle shaped to permit the bottle to stand upright on a flat horizontal surface, the lobes being disposed generally symmetrically about the symmetry axis of the bottle with a petaloid-lobe-separation notch extending generally radially between each pair of adjacent petaloid lobes, undersides of the petaloid lobes being substantially coplanar with respect to one another to form lobe bottom surfaces for contacting the surface on which the bottle stands, the case being molded from a plastic material and comprising:

(a) an outer shell;

(b) a plurality of support elements connected to and generally disposed within the outer shell for reinforcing the shell, the outer shell and support elements being shaped to define a plurality of bottle pockets for receiving the bases of PET bottles, the number of bottle pockets defining a case-bottle-capacity number, a pocket centerline being defined to extend generally centrally through each bottle pocket;

(c) a case-bottle-capacity number of bottle seating means for seating a bottle inserted into a bottle pocket, each bottle seating means being associated with a bottle pocket and being connected to at least one of the outer shell and the support elements and including:

(c.1) a plurality of dual-base-engagement projections disposed in a generally annular array generally symmetrically about the pocket centerline, the dual-base-engagement projections extending generally parallel to the pocket centerline and projecting into the bottle pocket,



the number of dual-base-engagement projections being equal to the number of petaloid lobes formed in the base of a PET bottle of the petaloid type;

(c.2) base-cup-bottle alignment means for orienting a PET bottle of the base-cup type seated in the bottle pocket so that the longitudinal symmetry axis of the bottle extends generally parallel to the pocket centerline of the bottle pocket, the base-cup-bottle alignment means having a base-cup-bottle annular-bottom-surface contact surface oriented generally normal to the pocket centerline and disposed to contact the annular bottom surface of the base cup of the bottle to orient the bottle, the base-cup-bottle annular-bottom-surface contact surface defining a base-cup-bottle annular-bottom-surface contact plane, the dual-base-engagement projections being shaped and positioned to fit within and engage the annular base-cup indentation in the base cup of the bottle seated in bottle pocket to tend to stabilize the bottle; and

(c.3) petaloid-bottle alignment means for orienting a PET bottle of the petaloid type seated in the bottle pocket so that the longitudinal symmetry axis of the bottle extends generally parallel to the pocket centerline of the bottle pocket, the petaloid-bottle alignment means having a plurality of petaloid-bottle lobe-bottom-surface contact surfaces, the petaloid-bottle lobe-bottom-surface contact surfaces being substantially tangent to a plane which defines a petaloid-bottle lobe-bottom-surface contact plane, the petaloid-bottle lobe-bottom-surface contact plane being oriented generally normal to the pocket centerline, the petaloid-bottle lobe-bottom-surface contact surfaces being disposed generally symmetrically about the pocket centerline at locations to register with and contact the lobe bottom surfaces of the bottle to orient the bottle, the petaloid-bottle lobe-bottom-surface contact plane being spaced apart from the base-cup-bottle annular-bottom-surface contact plane in a direction along the pocket centerline, the petaloid-bottle lobe-bottom-surface contact plane being below the base-cup-bottle annular-bottom-surface contact plane when the case is in a horizontal rest position, the dual-base-engagement projections being shaped and positioned to fit within and engage the petaloid-lobe-separation notches between the petaloid lobes of the bottle seated in the bottle pocket to tend to stabilize the bottle; and

(d) a case-bottle-capacity number of case rests, each case rest being associated with a bottle pocket, the case rest being connected to the bottle seating means associated with the bottle pocket, the case rest being generally symmetrically located with respect to the pocket centerline, each case rest having a case-to-closure load-transmission surface, the case-to-closure load-transmission surface of the case rest facing away from the bottle pocket, the case rest being configured to locate a closure of a bottle oriented generally coaxially with the pocket centerline such that a top surface of the closure contacts the case-to-closure load-transmission surface, so that cases of bottles can be stacked one on top of the other with the case rests of an upper case resting on the closures of the bottles of a lower case with the case-to-closure load-transmission surfaces of the case rests in contact with the tops of the closures.

4,700,838

COMPOSITE CONTAINER FOR STERILE SOLID PRODUCTS

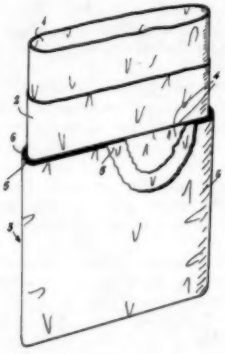
Marco Falciani, Milan, and Roberto Bonamigo, Usmate Di Velate, both of Italy, assignors to Antibiotici Cristallizzati Sterili s.r.l., Milan, Italy

Filed May 8, 1986, Ser. No. 860,994

Claims priority, application Italy, May 13, 1985, 20672A /85

Int. Cl.[4] B65D *75/26, 81/18*

U.S. Cl. 206—438 **5 Claims**

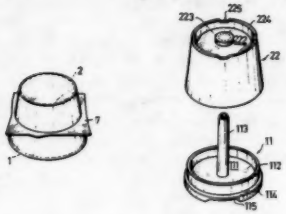


1. Composite container for sterile, solid products, characterized in that it comprises at least two separate bags, one inside the other with the inner bag directly containing the sterile solid product, having their respective ends hermetically sealed, wherein the inner bag is made of low-density polyethylene and the outer bag consists of three layers of different materials, polyethylene or polyvinylchloride forming an innermost layer, aluminium an intermediate layer and a polyester resin an outermost layer.

4,700,839
PACKAGE INCLUDING DISK-FORM MAGNETIC RECORDING MEDIUMS

Tatsuo Fujii, Saku, Japan, assignor to 501 TDK Corporation, Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,428
Claims priority, application Japan, Apr. 24, 1984, 59-60828[U]; May 8, 1984, 59-66722[U]
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—444 11 Claims



1. An improved package for holding and storing a plurality of disk-form recording mediums, each having a recording area that can be stacked atop one another without spacers therebetween, comprising:

a bottom member having a flat, circular surface which has an outside diameter greater than the outside diameters of the recording mediums to permit such flat surface to contact the entire recording area of a recording medium, the bottom member further having only one projection ring extending generally perpendicular from the flat surface of the bottom member, the projection ring having an exterior surface of a single, uniform configuration, the inside diameter of the projection ring being greater than the outside diameters of the recording mediums and less than the outside diameter of the bottom member;

a plurality of spaced apart legs fixed to the bottom member along its peripheral edge, each leg having an angulated side configuration;

a pillar fixed to the bottom member at its point of center and extending perpendicularly therefrom to a height that is at least equal to the height defined by the recording mediums when stacked;

a ceiling member having a flat, circular surface that is parallel to the flat surface of the bottom member the flat surface of the ceiling member having an outside diameter that is approximately equal to the outside diameters of the recording mediums and disposed around an interiorly concave portion of the ceiling member which extends about the flat surface of the ceiling member, the interiorly concave portion being configured and dimensioned to receive the pillar;

a cover member having a surface configured in a truncated cone form, the truncated portion of which is fixed about the ceiling member and includes a plurality of spaced apart cut-off portions, each cut-off portion having an angulated side configuration, the distal portion of the cover member opposite the truncated portion having only a single, uniform interior surface configuration, the interior surface capable of frictionally engaging the exterior surface of the projection ring;

a plurality of spacers, one of which can interface the flat surface of the bottom member and one recording medium and another of which can interface the flat surface of the ceiling member and one recording medium, each spacer being configured and dimensioned to transmit compression forces from the flat surfaces and equally across to the entire recording areas on the recording mediums;

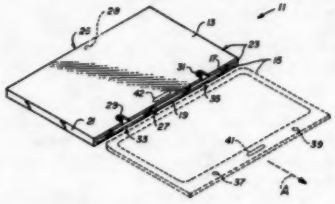
binding means for binding the cover member to the bottom member; and

wrapping means for wrapping the ceiling member, cover member, bottom member, legs, and binding means all within a vacuum sealed environment.

4,700,840
DATA CARD CASSETTE

Richard Haddock, Redwood City, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Filed Feb. 14, 1986, Ser. No. 829,720
Int. Cl.[4] B65D *43/12*
U.S. Cl. 206—449 13 Claims



1. A cassette comprising,

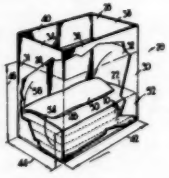
a movable drawer supporting a first wallet-size data card with a strip of laser recording material thereon, said data card being integral with said drawer, said drawer also having a detent and a means for pulling said drawer at a front end of the drawer, and

a cassette case having sides defining a slot at a front end in said case, said slot being of a size and shape to slidably receive said drawer, said drawer being selectively removable from said cassette case.

4,700,841
METHOD FOR PACKING FLEXIBLE, FLAT PACKAGES INTO A CARTON

Lonnie W. Padgett, Jr., Acworth, and Charles L. Davis, Atlanta, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 4, 1986, Ser. No. 848,430
Int. Cl.[4] B65D *85/62;* B65B *11/58*
U.S. Cl. 206—499 7 Claims



1. A method for packing a stack of flexible, flat packages into a carton having a bottom, sides, ends and a top opening, to facilitate removal therefrom, wherein the method comrises:

a. placing the stack of packages in a liner bag having a body and a neck;

b. orienting the liner bag within the carton with the neck extending toward and coinciding with top opening of the carton and orienting the stack of packages within the bag in an initial position with respect to the carton so that the stack fits loosely between the sides of the carton; and

c. rotating the bag and stack of packages together to a final position in which the stack fits snugly between the sides and the ends of the carton and the neck extends around the

stack and toward the carton opening from a position adjacent the carton sides.

4,700,842

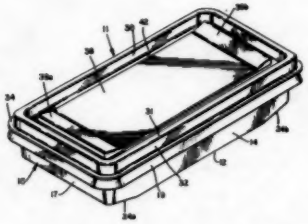
STACKABLE STORAGE CONTAINER

Gerald M. Grusin, Chicago, Ill., assignor to Dart Industries, Inc., Northbrook, Ill.

Continuation of Ser. No. 299,297, Sep. 3, 1981, abandoned. This application Aug. 5, 1983, Ser. No. 520,828

Int. Cl.⁴ B65D *21/02*

U.S. Cl. 206—508 **9 Claims**



1. A stackable covered storage container, comprising:

a container comprising a bottom wall having sides and ends, and further comprising side walls and end walls extending upwardly from the sides and ends of said bottom wall to form an open mouth of the container;

said bottom wall having a substantially flat central portion, and having at least one end panel sloping upwardly from an end of said central portion to form a beveled surface joining said end of the central portion to the adjacent end wall;

a closure configured to fit on said open mouth of said container;

said closure including a central panel having sides and ends, and configured to receive the bottom wall central portion of a like container stacked on the closure; said closure having a peripheral rim flanking said sides of said central panel to extend above a portion of the side walls of the like container stacked on the closure, said peripheral rim thereby obstructing sideways sliding movement of the stacked like container; and

a ramp portion sloping upwardly from said closure central panel adjacent one end of said central panel to receive said bottom wall beveled surface of a stacked like container in complementary fit,

so that the complementary ramp portion and beveled surface permit sliding relative movement of a stacked container along siad one ends to remove a container from the stack, and said peripheral rim obstructs such movement along said sides.

4,700,843

PIZZA CROWN ASSEMBLY

Jerome Cohen, 40 Lee Way, Madison, Conn. 06443

Filed Jun. 26, 1986, Ser. No. 878,584

Int. Cl.⁴ B65D *85/36*

U.S. Cl. 206—521 **15 Claims**

1. A folding carton blank including a detachable carton support element defining initially a unitary piece of paperboard for packaging food products such as pizza pies and the like comprising:

a paperboard blank cut and scored to define when erected a closed carton having a top wall and a bottom wall;

said bottom wall being bounded by opposed side walls and opposed end walls to define an enclosure;

said top wall being hinged to one of said end walls and side walls;

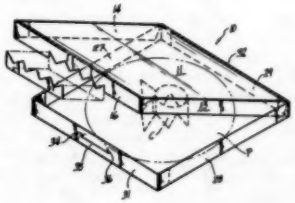
said top wall having a plurality of depending flaps operable when said carton is erected to be received within said enclosure in telescopic fashion;

a central portion of said top wall having a tendency to collapse when loaded cartons are stacked vertically;

a detachable carton support element adapted to be formed into a collar connected to the blank by a line of weakness; and,

locking means formed on said support element for converting said element into a collar upon detachment;

said collar being operable to provide central structural support between said top and bottom walls when said carton is erected and in the closed condition.



12. In a paperboard container having a top wall and a bottom wall including telescoping side walls with a food product disposed in said container upon said bottom wall, the improvement comprising:

a detachable element adapted to be formed into a collar having opposed ends connected to said container and defining with said container a single structure, locking means incorporated in said opposed ends for connecting said ends to develop a collar, said element being operable upon detachment from said container and upon formation of said collar to be disposed centrally of said container upon said food product to maintain spacing between the surface of the food product and said top wall and to support said top wall.

4,700,844

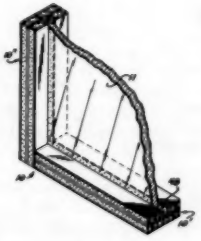
PACKAGING WRAP

William R. Griffith, 685 Converse Dr., Cincinnati, Ohio 45240

Filed Jun. 14, 1985, Ser. No. 744,927

Int. Cl.⁴ B65D *5/50, 25/10*

U.S. Cl. 206—586 **12 Claims**



1. A method of constructing a packaging wrap for supporting and protecting at least one article, which method comprises:

bonding a first layer of flexible material to a first major surface of a layer of shock absorbing material, the layer of shock absorbing material having first and second parallel edges along two sides of the first major surface;

severing the layer of shock absorbing material along first and

second cutting lines, the first and second cutting lines being parallel to the first and second parallel edges of the layer of shock absorbing material, and the distance between the first cutting line and the first parallel edge of the layer of shock absorbing material plus the distance between the second cutting line and second parallel edge of the layer of shock absorbing material being less than the distance between the first and second cutting lines;

folding the first layer of flexible material along a first fold line located directly over the first cutting line so as to fold a first portion of the first layer of flexible material back on itself and to rotate the portion of the shock absorbing material between the first cutting line and its first edge over onto the first layer of flexible material;

folding the first layer of flexible material along a second fold line located directly over the second cutting line so as to fold a second portion of the first layer of flexible material back on itself and to rotate the portion of the shock absorbing material between the second cutting line and its second edge over onto the layer of flexible material, whereby a gap is formed beteen the first and second edges of the shock absorbing material over a portion of the shock absorbing material between the first and second cutting lines.

4,700,845

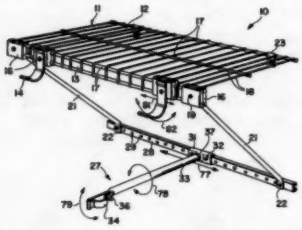
BICYCLE STORAGE SYSTEM

Richard B. Fretter, 482 Boynton Ave., Berkeley, Calif. 94707

Filed Nov. 12, 1985, Ser. No. 796,936

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—18 **6 Claims**



1. A bicycle storage rack comprising a pair of hooks; a storage shelf having a front edge or lip adapted for mounting the hooks at a number of spaced positions for hanging a bicycle and having first and second brackets mounted toward the rear edge thereof for providing first and second points for mounting the bicycle rack to an external support such as a wall; a pair of angled braces mounted at one end toward the front edge of the shelf and extending downward and rearward to form third and fourth mounting points for mounting the bicycle rack to an external support such as a wall; support means comprising a support bar adapted for mounting to the ends of the brace or to an external support; a base adapted for mounting at selected positions along the length of the support bar; a rod rotatably mounted at a first end thereof to, and extending forward from, the base, the axis of rotation being transverse to the length of the support bar; and clamping means pivotally mounted adjacent the opposite end of the rod for mounting to a bicycle at a third suspension point, the pivot axis being transverse to the rotation axis.

4,700,846

APPARATUS FOR MOUNTING PRINTED CIRCUIT BOARDS ON AN INSTRUMENT RACK

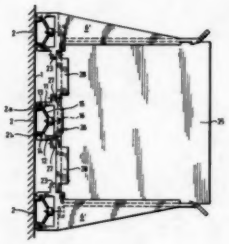
Joris Schroder, Lucerne, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed Oct. 10, 1986, Ser. No. 917,688

Claims priority, application Switzerland, Oct. 17, 1985, 04483/85

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—41 **18 Claims**



1. An apparatus for mounting printed circuit boards on an instrument rack having support rails, including a pair of holders for engaging opposed edges of a printed circuit board, each of the holders comprising:

a body having a pair of facing flange engaging grooves formed therein adapted to slidably engage a pair of outwardly extending flanges formed on an instrument rack support rail;

a guide groove formed in said body and adapted to engage an edge of a printed circuit board; and

clamping means on said body cooperating with said flange engaging grooves for selectively preventing relative movement between the holder and an instrument rack support rail.

4,700,847

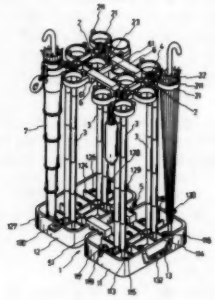
RETRACTILE UMBRELLA COVER AND KNOCKDOWN UMBRELLA STAND

Song-Huei Shieh, 3rd Fl., No. 558, Sec. 7 Chung-Hsino E. Road, Taipei, Taiwan

Filed Oct. 27, 1986, Ser. No. 925,153

Int. Cl.[4] A47G *25/12*

U.S. Cl. 211—62 **5 Claims**



1. A collapsible knockdown umbrella stand comprising:

opposed, rectangular first and second boxes, each having a bottom wall and upstanding side walls; partition means disposed within each box defining separate compartments

including a plurality of large compartments disposed along a pair of opposed walls; retaining means disposed on the bottom of each large compartment for releasably retaining the end of a cylindrical umbrella holder;

releasable fastening means carried by said boxes for attaching the upper surfaces of said side walls to form a closed container when the stand is collapsed and handle means on the exterior surface of each of said boxes for carrying said closed container;

a pair of holder elements, each mounting a plurality of umbrella cover retaining rings, each adapted to be disposed over and spaced above an open box when said stand is assembled, each ring disposed over a respective large compartment and each element dimensioned to fit within a box when said stand is collapsed, each element mounting a plurality of upstanding stubs whereby when said stand is assembled, folded umbrellas may be hung from said stubs;

a plurality of collapsible vertical support means for interconnecting each element and spacing said element above a respective box when said stand is assembled and for collapsing to a length sufficient to fit within said box when said stand is collapsed;

a plurality of cylindrical, telescoping umbrella covers, each having a large open end dimensioned to fit within a retaining ring of one of said elements and a small closed end adapted to be retained in a corresponding large compartments in one of said boxes when said stand is assembled, and adapted to telescope to a dimension sufficient to fit within said closed container when said stand is collapsed; and

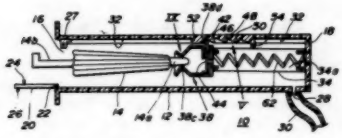
connecting means releasably interconnecting said boxes and said elements at a side thereof when said stand is assembled and for fitting within a box when said stand is collapsed.

4,700,848

UMBRELLA HOLDER FOR VEHICLE

Hiroyuki Fujiki, Isehara; Yoshiharu Michiura, Chigasaki, and Masafumi Abe, Atsugi, all of Japan, assignors to Nissan Motor Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1986, Ser. No. 947,713
Claims priority, application Japan, Jan. 10, 1986, 61-3195
Int. Cl.[4] A47F 7/00
U.S. Cl. 211—63 **18 Claims**



1. An umbrella holder comprising:

an elongate casing having one end opened and the other end closed;

a tip holder axially movably disposed in said elongate casing, said tip holder having a catching portion by which a tip portion of an umbrella is caught upon insertion of the umbrella into the casing through the opened end;

first biasing means for biasing said tip holder toward the opened end;

locking means for locking said tip holder at a desired position relative to said elongate casing, said locking means suppressing said tip holder from moving toward the opened end while permitting the same from moving toward the closed end; and

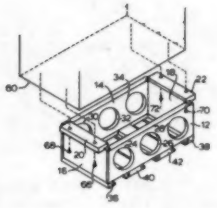
unlocking means disabling said locking means when said tip holder is rotated in a given direction about the axis thereof.

4,700,849

COMBINATION WINE RACK AND GLASS RETENTION/DISPENSING ASSEMBLY

Leonard A. Wagner, 1903-B Peppertree St., Durham, N.C. 27705

Filed Jan. 20, 1987, Ser. No. 4,869
Int. Cl.[4] A47F 7/28
U.S. Cl. 211—71 **12 Claims**



1. A combination wine rack and glass retention/dispensing assembly, comprising:

(a) a main housing comprising front, rear, and side walls, said front and rear walls having openings therein to receive bottles having neck and base portions, the openings(s) in said front wall being in registry with corresponding opening(s) in said rear wall, to retain bottles therein in a substantially horizontal positions, with said neck portion protruding from a front opening and said base portion protruding from a rear opening in registry with said front opening;

(b) an outwardly extending mounting flange joined to an upper end of at least one of said walls of said housing, for fixedly mounting the assembly against an overlying horizontal surface;

(c) an L-shaped first member having web and foot portions, joined at an upper end of its web to a lower end of a said side wall, and extending from said front wall to said rear wall, with its foot inwardly laterally extending from a lower end of said web;

(d) a second member having web and foot portions, and a shape selected from the group consisting of L-shape and inverted T-shape, joined at an upper end of its web to lower ends of said front and said rear walls in laterally spaced substantially parallel relationship to said L-shaped first member joined to said side wall, and with a foot of said second member laterally extending from a lower end of said second member web toward said L-shaped first member, to cooperatively form therewith a track for retention and dispensing of glasses having a stem attached to a generally planar base, in which the glass is positionable in said track in an inverted orientation, with the feet of the L-shaped first member and said second member forming said track supporting the retained glass(es) in said inverted orientation; and

(e) a stop element in said track at said rear wall.

4,700,850

ROTATABLE STORAGE DEVICE

Tamara M. Morgan, 146 Juniper Dr., Freehold, N.J. 07728; Richard R. Roig, Oak Ridge, and Michael Hrehovcik, Little Falls, both of N.J., assignors to Tamara M. Morgan, Freehold, N.J.

Filed Dec. 20, 1985, Ser. No. 811,288
Int. Cl.[4] A47F 5/02
U.S. Cl. 211—131 **13 Claims**

1. An improved storage device including:

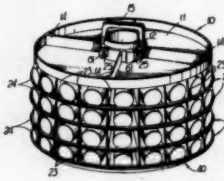
(a) a rotating base;

(b) a first storage tray having a circular exterior dimension removably attached to said rotating base.

(c) a second storage tray having a circular external dimen-

sion, said second storage tray being situated on top of said first storage tray and removably attached to said first storage tray.

(i) said first storage tray including an annular core extending up from the base of said first storage tray, said annular core including a plurality of circumferential attachment tabs; and



(ii) said second storage tray including an annular recess in the bottom of the base of said second storage tray, said annular recess being adapted for receiving said annular core of said first tray and further including means for accepting said circumferential attachment tabs and for removably latching said circumferential attachment tabs within said annular recess.

4,700,851

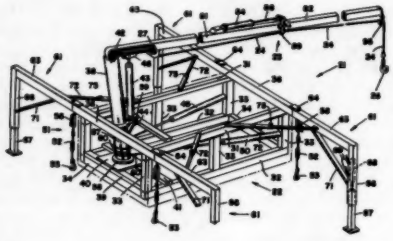
LIGHTWEIGHT, SELF-POWERED, TRANSPORTABLE CRANE ASSEMBLY

Richard J. Reeve, and George I. Noah, both of 5250 D Highway 50 East, Carson City, Nev. 89701

Filed Apr. 18, 1985, Ser. No. 724,563

Int. Cl.[4] B66C *23/44, 23/26, 23/06, 23/78*

U.S. Cl. 212—181 **4 Claims**



1. In a crane assembly including frame means formed and dimensioned for mounting to a pick-up truck having a truck bed with upstanding side walls mounted on a truck frame, a lifting boom assembly movably mounted on said frame means for movement in a plurality of directions relative thereto, movable cable lifting means mounted on said lifting boom assembly coupling means releasably coupling said frame means to said pick-up truck, and crane support means carried by said frame means and movable between a stored position and a deployed position, wherein the improvement in said crane assembly comprises:

said frame means being dimensioned for and received between said upstanding side walls of said truck bed;

said coupling means including at least one coupling bar means extending transversely of said bed beneath an underneath side of said truck frame and terminating in bar ends proximate opposite sides of said truck bed, linkage means coupled between each of said bar ends and said frame means, cinching means provided in at least one of said linkage means for cinhcing of said bar means up against said underneath side of said truck frame, and at least one of said linkage means being removably coupled to said bar means to enable removal of said crane assembly from said pick-up truck;

said crane support means being carried by said frame means for movement into and out of engagement with a support surface on which the pick-up truck is supported to stabilized said crane assembly when coupled to said pick-up truck, said crane support means further being adapted for stand-alone support of said crane assembly when the latter is detached from said pick-up truck, said crane support means includes adjustable means to place said crane assembly in position to be selectively coupled and uncoupled to said pick-up truck; and

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4,700,852

RECOVERY VEHICLE DEVICE

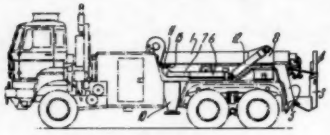
Jan-Olov Mjöberg, Mora, Sweden, assignor to Mora Hydraulics Aktiebolag, Mora, Sweden

Filed May 13, 1985, Ser. No. 733,640

Claims priority, application Sweden, Jul. 17, 1984, 8403746; Oct. 15, 1984, 8405129

Int. Cl.[4] B66C *23/78*

U.S. Cl. 212—189 **4 Claims**



4. Recovery vehicle comprising a vehicle, lowerable supporting stiffleg means located proximate the rear of said vehicle for supporting said vehicle during recovery operations, a main boom, turntable means, said main boom mounted on said turntable means for pivotable movement about a horizontal axis, said turntable means being rotatable for turning the main boom about a vertical axis of rotation, a boom foot mounted on said main boom, a folding boom mounted on said boom foot and including an extendable extension thereof, attachment means mounted on said main boom, said main boom being displaceable relative to said attachment means between a forward transport position, wherein said main boom is lowered to a substantially horizontal transport position wherein the boom foot with folding boom and extension thereon are generally located between said stiffleg means, and a rear working position, wherein the boom foot with folding boom and extension thereon are unobstructed by said stiffleg means, even when said main boom is lowered into a substantially horizontal position, so that said main boom is free to turn about said vertical axis of rotation.

4,700,853

SLACKLESS RAILWAY COUPLER CONNECTION

Russell G. Altherr, Munster, Ind., and John W. Kaim, Chicago, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

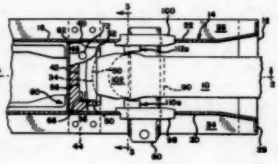
Filed Jan. 14, 1985, Ser. No. 691,077

Int. Cl.[4] B61G *7/10*

U.S. Cl. 213—50 **10 Claims**

8. An improved coupler member for a railway car said coupler having a shank with a draft key slot for installation in

the center sill of a railway car, the improvement comprising: curved surfaces that are convex and of generally spherical



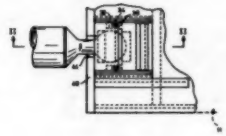
portions which curved surfaces are positioned on opposite sides of said shank in areas adjacent the key slot therein.

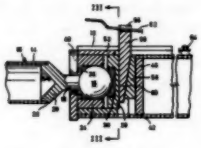
4,700,854

OPEN TOP DRAW BAR ARRANGEMENT HAVING REMOVABLE WEDGE

Dennis Chadwick, Amherstview, Canada, assignor to Urban Transportation Development Corporation, Ltd., Toronto, Canada

Filed Jul. 11, 1985, Ser. No. 753,953
Claims priority, application Canada, Jun. 7, 1985, 483390
Int. Cl.[4] B61G 9/22
U.S. Cl. 213—62 R 13 Claims





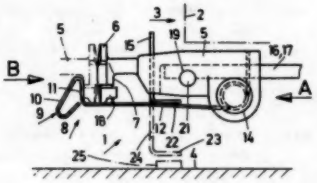
1. A draw bar for use with a car having a draw bar pocket including an open top, and a slotted draft plate and a buff plate, the draw bar comprising a bar body, a spherical head connected to said body by a neck and a thrust ring disposed about said neck, said neck being dimensioned to pass through the slotted draft plate of the draw bar pocket with the thrust ring disposed between the head and the draft plate, a thrust insert disposed at the distal side of the head for positioning, in use, between the head and the buff plate of the draw bar pocket, and displaceable longitudinally relative to said thrust ring and biasing means to bias continuously said insert toward said ring to eliminate play between said head and said ring and insert, said biasing means including wedge means disposed in and being removable from said draw bar pocket through said open top, while maintaining engagement of said draw bar with said draw bar pocket.

4,700,855

AUTOMATIC COUPLING FOR MODEL RAIL VEHICLES

Hanspeter Boeniger, Widen, Switzerland, assignor to Georg Utz AG, Bremgarten, Switzerland

Filed Jan. 30, 1985, Ser. No. 696,419
Claims priority, application Switzerland, Jan. 31, 1984, 526/84
Int. Cl.[4] B16G 1/06, 1/36
U.S. Cl. 213—75 TC 10 Claims



1. An automatic coupling particularly for model rail vehicles comprising a coupling carrier disposed along substantially the central longitudinal axis of a rail vehicle and having an end extending axially outwardly of an end of the rail vehicle, a coupling plate on the axially extending end of the coupling carrier, and a coupling hook resiliently mounted on said coupling carrier and having an end protruding axially beyond said coupling plate, said coupling hook having a portion on said protruding end extending into the outline of said coupling plate, said coupling hook portion resiliently engages the rear side of a like coupling plate of a second rail vehicle in a coupled position in such a manner that said coupling plate is in face-to-face abutment with said like coupling plate at all times to avoid any gap between coupled coupling plates of two rail vehicles.

4,700,856

BABY BOTTLE WITH DISPOSABLE LINER

William O. Campbell, and Nickie G. Campbell, both of 1107 W. Shawnee, Muskogee, Okla. 74402

Continuation-in-part of Ser. No. 790,090, Oct. 22, 1985, which is a continuation of Ser. No. 597,388, Apr. 6, 1984, Pat. No. 4,570,808. This application Dec. 29, 1986, Ser. No. 947,402
Int. Cl.[4] A61J 9/00, 9/08; B65D 23/10
U.S. Cl. 215—11 E 8 Claims

7. A baby bottle, comprising a container defining a continuous space and having—

(a) an elongated body portion with an open bottom;

(b) an open neck portion capable of receiving a nipple and ring thereon;

(c) a pair of corresponding, opposing recesses formed longitudinally in the body portion, the pair of recesses creating two elongated, substantially tubular handles,

wherein each of the two handles has a first area with a first, cross-sectional dimension in the vincinity of the opposing recesses which is smaller than a second crosssectional dimension thereof in the vicinity of the recesses;

(d) a liner with a closed end and an open end, the closed end extending into the continuous space and the open end being positioned between the neck portion and the nipple by the ring; and

wherein, the two handles can be grasped by a baby to support the container during feeding.

4,700,857

CONTAINER WITH FUSED CLOSURE

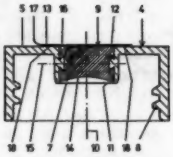
Peter Kittscher, Buettgen, and Herbert Buecheler, Erkrath, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 6, 1986, Ser. No. 893,859

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1985, 3532041; Jan. 16, 1986, 3601016

Int. Cl.[4] B65D *41/00*

U.S. Cl. 215—232 **22 Claims**



1. A container for cleaning preparations, said container having a fused closure comprising a closure stopper disposed in a closure hole of said container, wherein said closure stopper is made of a material which melts at a predetermined temperature and releases the closure hole for the exit of a product packaged in said container, said closure hole having a raised ring integrally formed with the peripheral surface of said closure hole wherein said raised ring projects in the direction of the axis of said closure hole, and further wherein said ring increases in thickness as it extends radially from said peripheral surface of said closure hole inwards towards said axis of said closure hole.

4,700,858

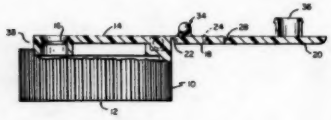
PLASTIC ENCLOSURE HAVING LIVING HINGES

Robert A. Bennett, Easton, Conn., assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed Apr. 2, 1986, Ser. No. 847,260

Int. Cl.[4] B65D *47/08*

U.S. Cl. 215—237 **2 Claims**



1. A plastic device adapted to engage and close the open neck of a container and comprising:

a vertical hollow cylinder open at its lower end,

a deck sealing the upper end of the cylinder, the deck having an opening communicating with the interior of the cylinder;

a cap for the deck having essentially the same shape and area as the deck, the cap consisting of a first relatively small section and a second relatively large section, the first section being fixedly secured to a corresponding portion of the deck, the two sections having facing edges whih are spaced from each other by a common central region which defines an integral living hinge between said first and second sections and said hinge being spaced from said facing edges in a direction away from first section;

a prong secured to the second section and extending at right angles thereto, the prong being insertable into and removable out of the opening in the deck.

4,700,859

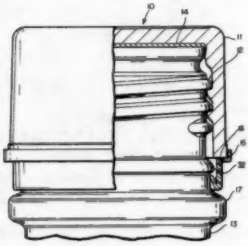
TAMPER INDICATING CLOSURE

James L. Gregory, Toledo, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Aug. 11, 1986, Ser. No. 895,070

Int. Cl.[4] B65D *41/34*

U.S. Cl. 215—252 **6 Claims**



1. A tamper indicating package comprising a container with a threaded neck finish and a retaining ring interdisposed between said threaded portion and the body of the container, an internally threaded skirted closure compatable with the threads on said finish, a tamper indicating ring in telescopic arrangement with and fastened to the extremity of said closure skirt so that there is circumferential contact between said closure extremity and said tamper indicating ring, said tamper indicating ring comprised of first and second sections with frangible means interdisposed between said sections and wherein a portion of each of said sections abuts against said extremity of said closure skirt so that an axial force can be transmitted to said ring to cause a frusto-conical portion thereof to lodge beneath said container retaining ring, and when the closure is rotated, in a retrograde manner, the frangible means are severed.

4,700,860

TAMPER INDICATING VACUUM PACKAGE

Ernest L. Li, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 31, 1986, Ser. No. 846,447

Int. Cl.[4] B65D *41/48*

U.S. Cl. 215—256 **2 Claims**

1. A hermetically sealed package comprising

a container having a neck with an opening and a closure,

said neck having a top surface and a side surface,

said container including a first annular bead at the upper end adjacent the opening and a second annular bead spaced axially below the first bead and having a greater diameter than the first bead on the container,

said closure being made of plastic and comprising a base wall and a peripheral skirt,

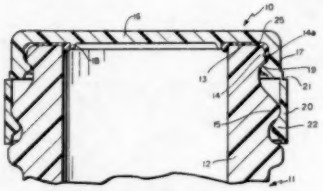
said base wall including an annular bead on the internal surface thereof,

said peripheral skirt including an interrupted first annular bead on the internal surface thereof spaced axially from

said base wall and engaging said first annular bead on the container,

said first annular bead on said base wall and said bead on said peripheral skirt defining an annular channel having a portion along the inner surface of said base wall and a portion along the inner surface of said peripheral skirt,

a sealing gasket being cast in situ in the portions of the channel defined by the first annular bead on said base wall and the first bead said peripheral skirt and extending axially along the inner surface of said peripheral skirt to



the interrupted first annular bead on said skirt such that when the annular bead on the closure engages the first annular bead on the container, it causes the sealing gasket to deform such that the top surface and side surface of the neck of the container are sealed against the gasket,

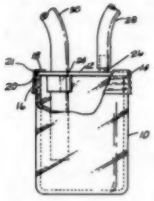
a tamper indicating band connected along a weakened line to the peripheral skirt and including a second interrupted annular bead on said band spaced from said weakened line engaging and having a greater diameter than the first interrupted bead on said skirt and engaging said second bead on the container.

4,700,861

CONTAINER CAP FOR LIQUID TRANSFER

Theodore C. Neward, 521 Scripps Dr., Claremont, Calif. 91711

Filed Sep. 10, 1986, Ser. No. 905,793
Int. Cl.[4] B65D *47/14*
U.S. Cl. 215—309 **15 Claims**



1. A container lid for liquid transfer comprising:

a lid having an upper and a lower side;

a hollow fluid transfer sleeve extending outward from the lower side of the lid, forming a fluid transfer passage in the lid, wherein said hollow fluid transfer sleeve has a double-inwardly tapered interior wall comprised of a first taper extending from the lid to an intermediate point along the sleeve and a second taper extending from said intermediate point to the end of the sleeve, said second taper being of a greater angle than said first taper; and

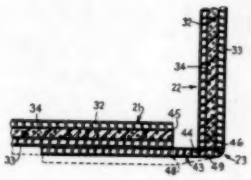
a hollow air transfer sleeve extending outward from the upper side of the lid wherein said air transfer sleeve forms an air transfer aperture in the lid.

4,700,862

COLLAPSIBLE SIDEWALL STRUCTURE FOR STACKABLE BIN

Alan T. Carter, Elkhart, Ind.; Lloyd W. Carter, and Richard Earl, both of Sturgis, Mich., assignors to Carter Associates, Sturgis, Mich.

Filed Aug. 8, 1986, Ser. No. 894,603
Int. Cl.[4] B65D *19/00*
U.S. Cl. 220—6 **13 Claims**



1. In a collapsible storage bin having a collapsible six-fold sidewall structure which is horizontally of generally rectangular shape and defines a vertically extending opening therethrough, and upper and lower pallet-like supports removably engaged with the respective upper and lower edges of said sidewall structure for closing off said sidewall structure and defining a storage compartment therein, said sidewall structure including a pair of substantially parallel sheet-like side walls joined together by a pair of sheet-like end walls, the end and side walls having adjacent vertical edges joined together by a corner fold structure which permits relative horizontal swinging movement between the adjacent end and side walls, and each said end wall having a center fold structure extending vertically thereacross substantially midway between the vertical end edges thereof for dividing the end wall into two plate-like wall portions which are horizontally relatively swingably movable about said center fold structure, the improvement comprising:

each said side and end wall being constructed as a multi-ply laminate having substantially coextensive inner and outer layers fixedly secured to and substantially coextensively overlying opposite side faces of an intermediate layer;

each said inner and outer layer being constructed of plastic and having substantially parallel inner and outer plastic facing sheets joined together by a plurality of substantially parallel plastic ribs which extend transversely between and are rigidly joined to said facing sheets, said ribs and sheets cooperating to define therebetween a plurality of elongated and substantially parallel channels which are enclosed between said facing sheets, the ribs and channels of at least one of said inner and outer layers being elongated substantially vertically; and

said intermediate layer being constructed as a sheet of lightweight rigid plastic foam.

4,700,863

SEAL WELDED CAST IRON NUCLEAR WASTE CONTAINER

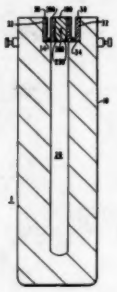
Arthur M. Filippi, Pittsburgh, and Richard P. Sprecace, Murrysville, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 569,070, Jan. 9, 1986, abandoned. This application Sep. 16, 1986, Ser. No. 910,241
Int. Cl.[4] B65D *8/22*
U.S. Cl. 220—67 **3 Claims**

1. An article of manufacture comprising a cast iron container having an opening at one end and a cast iron plug;

a first nickel-carbon alloy fusion weldable insert surrounding said opening and metallurgically bonded to said cast iron container at said one end of said container; a second nickel-carbon alloy insert metallurgically bonded to said cast

iron plug located within said opening and surrounded by the first insert said inserts being jointed by a fusion bond in said opening without heating said cast iron container to an austenite formation temperature thereby sealing the interior of the container from the exterior ambient outside said opening; said nickel-carbon alloy containing about 2 to 5 w% carbon; and both said nickel-carbon alloy insert and said cast iron container have a microstructure containing a graphite phase.



4,700,864

SYNTHETIC MATERIAL VEHICLE FUEL TANK

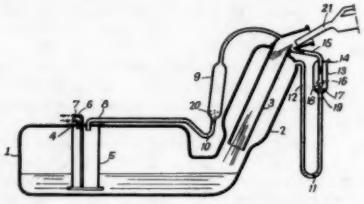
Henri Galles, Aulnay sur Mauldre, and Bernard Elias, Elancourt Maurepas, both of France, assignors to Regie Nationale des Usines Renault, Bolougne-Billancourt, France

Filed Jun. 12, 1986, Ser. No. 873,688

Claims priority, application France, Jun. 14, 1985, 85 09044

Int. Cl.[4] B65D *25/00*

U.S. Cl. 220—86 R **7 Claims**



1. A vehicle fuel tank formed of synthetic material and comprising:

a main enclosure;

a first expansion chamber communicating with said main enclosure;

a fuel filler pipe fitted in said first expansion chamber;

a gas evacuation line connected between an upper portion of said main enclosure and said fuel filler pipe, said gas evacuation pipe having an enlarged portion forming a second expansion chamber and a downwardly bent portion between said main enclosure and said second expansion chamber for forming a first siphon;

a cylindrical module connected to said upper portion of said main enclosure and extending thereinto, said gas evacuation line communicating with the interior of said module;

a fuel feed line communicating with the interior of said module;

a fuel return line communicating with the interior of said module; and

a conduit connecting an upper part of said fuel filler pipe with an upper part of said first expansion chamber, said conduit including means for preventing the flow of fuel through said conduit in one direction from said first expansion chamber to said fuel filler pipe.

4,700,865

TEAR-OPEN CAN MEMBER

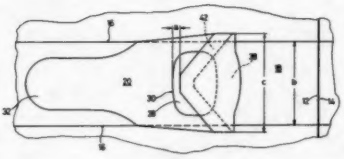
Felix Kramer, Friedlisberg, Switzerland, assignor to Elpatronic AG, Switzerland

Filed Nov. 25, 1986, Ser. No. 934,692

Claims priority, application Switzerland, Jan. 10, 1986, 00078/86

Int. Cl.[4] B65D *17/36*

U.S. Cl. 220—274 **7 Claims**



1. A tear-open can member comprising:

a sheet-metal member having a pair of generally parallel scorings (16) which define a tear-off strip (18) therebetween, and a tongue (20) which is welded as a separate sheet-metal member to the tear-off strip (18) at one of its ends in a welding region (42) which extends substantially over the whole width (b) of the tear-off strip (18), the sheet-metal member also having a starting scoring (30) which extends over the tear-off strip (18) between the welding region (42) and the free end (32) of the tongue (20), and which extends substantially transversely to the parallel scorings (16) only in a central region of the tear-off strip (18) and away from the free end (32) of the tongue (20) in the vicinity of the parallel scorings (16), and the welding region (42) covers the starting scoring (30) in the vicinity of each of the two parallel scorings.

4,700,866

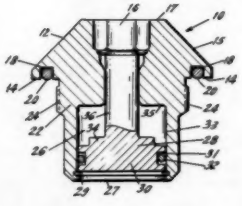
PRESSURE LOCKING FILLER CAP

Herbert Taylor, Bennington, Vt., assignor to Bijur Lubricating Corp., Bennington, Vt.

Filed Nov. 14, 1986, Ser. No. 930,799

Int. Cl.[4] B65D *45/00*

U.S. Cl. 220—316 **18 Claims**



1. A pressure locking cap, comprising:

a cap body having a top portion with a top surface and having a bottom portion, the bottom portion being insertable into an opening in a vessel which may be pressurized;

a tool receiving socket defined in the top portion of the cap body extending inward from the top surface into the cap body, and the socket being shaped so that a tool inserted therein and operated therein may be used for removing the cap from the vessel;

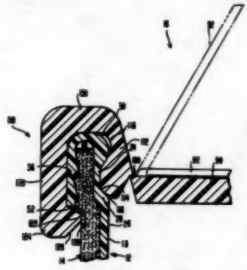
a piston disposed in the cap body and including a side thereof opening into the interior of the vessel for being subjected to the pressure in the vessel and the piston including blocking means movable into the socket as the piston is moved through the cap body, the blocking means moving into the socket occupying part of the socket for blocking insertion of the tool into the socket.

4,700,867

SLEEVED CONTAINER AND CLOSURE ASSEMBLY

Herbert V. Dutt, Sarasota, and Dixie L. Weir, Brandenton, both of Fla., assignors to Sun Coast Plastics, Inc., Sarasota, Fla.

Filed Feb. 25, 1986, Ser. No. 832,804
Int. Cl.[4] B65D *25/14*
U.S. Cl. 220—410 **9 Claims**



1. A sleeved container and closure assembly comprising:

an inner flexible plastic container, said inner container having a generally cylindrical upstanding sidewall and an integral bottom, an upper portion of said sidewall terminating at an inclined shoulder joined to an outwardly and downwardly directed flange through a transitional, radially outwardly directed, annular groove, said flange including a flange web having spaced wedge rings on an inner surface;

an outer cardboard sleeve, said sleeve being generally in the form of a right circular cylinder and sized to closely surround said inner flexible container, an upper end of said outer sleeve being positionable within said flange and being deformed radially outwardly by contact with an outer wall of said transitional groove, a lower end of said outer sleeve being postionable adjacent said bottom of said inner container; and

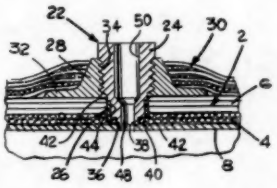
a snap-fit closure having a central cover disk and an annular circumferential clamping channel, said clamping channel including an inner sidewall having a tongue receivable in said transitional groove, a lower surface of said tongue being positionable in contact with said inclined shoulder, and a spaced outer sidewall terminating in an inwardly directed locking lip, said locking lip having a sharply angled upper locking surface which is positioned below a free end of said flange web, said locking lip further contacting said radially outwardly deformed upper end of said sleeve when said closure is applied to said flange, said clamping channel having a channel width sized to compress said spaced wedge rings against an outer surface of said radially deformed upper end of said outer sleeve, said sleeve and said inner container being secured to each other as said closure is secured to said sleeve and inner container to thereby form said sleeved container and closure assembly.

4,700,868

COMPOSITE PRESSURE VESSEL INCLUDING FLUID PORT WITH REPLACEABLE SEAL IN COMPOSITE SIDEWALL STRUCTURE AND METHOD OF CONSTRUCTING SUCH FLUID PORT

William Dirkin, Portage, Mich., assignor to Pneumo Abex Corporation, Boston, Mass.

Filed Mar. 28, 1986, Ser. No. 845,650
Int. Cl.[4] B65D *25/02, 25/38*
U.S. Cl. 220—465 **15 Claims**



1. A composite pressure vessel comprising a sidewall structure of composite material, a liner member lining the interior of said sidewall structure, and a fluid port through said sidewall structure and liner member, said fluid port comprising a radial hole through said sidewall structure, an externally removable porting plug extending into said radial hole, a seal groove at the inner end of said porting plug, a ring seal in said seal groove, said liner member having a porting hole therethrough in coaxial alignment with a through passage through said porting plug, and said ring seal being sized to form a fluid-tight seal with said liner member around said porting hole to prevent fluid leakage between said porting plug and liner member, the inner diameter of said seal groove being formed by a reduced diameter end portion on the inner end of said porting plug, and the outer diameter of said seal groove being formed by a back-up ring surrounding said reduced diameter end portion of said porting plug in radially spaced relation therefrom, said back-up ring extending coaxially along said porting plug beyond said reduced diameter portion, said porting plug having an external cylindrical surface of a diameter greater than said reduced diameter portion extending axially outwardly of said reduced diameter portion, said back-up ring extending over said external cylindrical surface, and said porting plug having an external shoulder adjacent the axial outer end of said external cylindrical surface which is engaged by the axial outer end of said back-up ring for positioning said back-up ring on said porting plug with said back-up ring surrounding said reduced diameter portion.

4,700,869

SINGLE ITEM VENDING MACHINE

Erwin Bogner, 12 Tompkins Ave., Babylon Village, N.Y. 11707

Filed Oct. 4, 1985, Ser. No. 784,613
Int. Cl.[4] G07F *11/16*
U.S. Cl. 221—229 **23 Claims**

1. A machine for vending a single item from a stack of items comprising:

a frame;

a slot in a front wall of said frame;

adjustment means for adjusting the height of said slot;

access means comprising a door with a handle mounted on said front wall of said frame for restricting access to said slot;

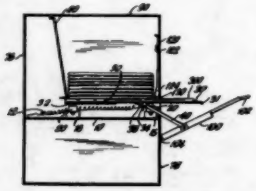
support means mounted within said frame;

slide means fixably mounted on said support means;

transfer means resting on said slide means generally in a fixed horizontal plane wherein a raised rear portion of said transfer means is at a level higher than a lower front portion of said transfer means, said door being connected

to said frame below the plane of the transfer means by means of a hinged connection; and

connecting means betweeen said access means and said transfer means whereby release of said access means by use of said activation means allows access to said slot and permits said transfer means to slide forward on said slide means, thus causing said raised rear portion of said transfer means to push an item out of said slot, said connecting



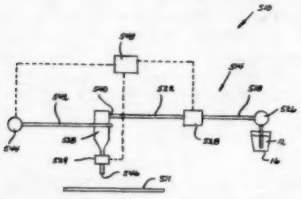
means comprising a first hinge, a second hinge and a lever arm whereby said first hinge is attached to said transfer means, a first end of said lever arm is connected to said first hinge, said second hinge is attached to said door and a second end of said lever arm is connected to said second hinge wherein said first hinge, said second hinge and said lever arm are all located below the plane of the transfer means and above said hinged connection of said door to said frame.

4,700,870

MOVABLE FLUID DISPENSER WITH AIR BUBBLE DETECTORS FOR CONTROLLING DISPENSER MOVEMENT

John K. Schleicher, Borden, and James R. James, Sr., Clarksville, both of Ind., assignors to Accuratio Systems, Inc., Jeffersonville, Ind.

Filed Feb. 18, 1986, Ser. No. 830,195
Int. Cl.[4] B67D *5/34, 5/06*
U.S. Cl. 222—63 **3 Claims**



1. An apparatus for dispensing a fluid comprising:

a source of fluid;

conduit means in flow communication with the fluid soruce;

means for moving the fluid from the source through the conduit means;

dispensing means having a fluid discharge associated with the conduit means for controlling the dispensing of fluid from the conduit means;

means for moving the dispensing means along a predetermined path;

first means for sensing the presence of a gas bubble included in the fluid moving through the conduit means upstream of the dispensing means, the first sensing means being operatively associated with the dispensing means moving means for slowing the movement of the dispensing means when an included gas bubble is sensed by the first sensing means; and,

second sensing means for sensing the presence of a gas bubble included in the fluid moving in the dispensing means upstream of the fluid discharge of the dispensing means, the second sensing means being operatively associated with the dispensing means moving means for stopping the movement of the dispensing means when an included gas bubble is sensed by the second sensing means.

4,700,871

LIQUID TRANSFUSING BOTTLE

Junichi Matsuo, Yokohama; Kozaburo Sakano, Kawasaki, and Isamu Takeda, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Oct. 21, 1985, Ser. No. 789,876
Claims priority, application Japan, Oct. 30, 1984, 59-164432[U]; Sep. 24, 1985, 60-145488[U]
Int. Cl.[4] B65D *1/02*
U.S. Cl. 222—107 **8 Claims**

1. In a liquid transfusing bottle made of flexible material including a barrel portion, and a shoulder portion at a top of said barrel portion and a bottom portion at a lower end of said barrel portion, said barrel portion having a flattened configuration having a front barrel portion and a rear barrel portion which are located opposite to one another in a direction of a shorter diameter with respect to a cross-sectional plane of the bottle, and side walls which are located opposite to one another in a direction of a longer diameter with respect to said cross-sectional plane and comprise sides of said front barrel portion and said rear barrel portion, said barrel portion being deformable and having a substantially symmetrical structure relative to an imaginary plane in which an imaginary parting line respectively extends along a middle part of both of the side walls in a longitudinal direction thereof, and deformation guiding parts formed relative to the side walls at a predetermined area with respect to the longitudinal direction of the bottle, the improvement wherein

each of said side walls defines a substantially flat side extending from the shoulder portion to the bottom portion, and said side walls are parallel to each other,

said front and rear barrel portions ending at said flat sides, said deformation guiding parts being cross-shaped, extending from adjacent said shoulder portion and said bottom portion partly in said front and rear barrel portions, crossing into the flat sides,

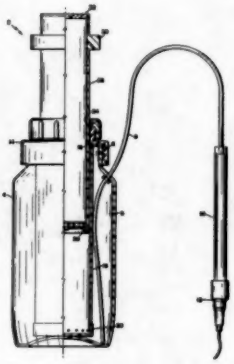
said deformation guiding parts each defining an edge such that a distance from said parting line at a corresponding side wall to the edge of a corresponding deformation guiding part decreases continuously approaching substantially a center of the corresponding side wall from substantially adjacent the shoulder portion and from substantially adjacent the bottom portion in the longitudinal direction of the bottle and in symmetrical relation relative to said parting line.

4,700,872

DISPENSING PUMP FOR SYRINGE

Paul H. Keyes, 5716 Tanglewood Dr., Bethesda, Md. 20817, and Marvin J. Taves, N-414, 1301 Delaware Ave., SW., Washington, D.C. 20024

Filed Aug. 19, 1986, Ser. No. 897,928
Int. Cl.[4] B65D *83/00*; A61M *5/18*
U.S. Cl. 222—162 **3 Claims**



1. A pump for dispensing a charge of liquid comprising:
a container defining a pump chamber,
a hollow cylinder supported in said chamber, said cylinder having an inner end connecting with said chamber via a first normally closed check valve which opens towards the chamber and an open outer end directed outwardly of the chamber,
a hollow plunger slideably disposed in said cylinder and connecting with the interior thereof via a second normally closed check valve opening towards the interior of the cylinder, said plunger having a normally open outer end adapted to receive a charge of liquid to be dispensed whereby upon out-stroke of the plunger, liquid is sucked through the second check valve from the plunger into the cylinder and upon in-stroke of the plunger the liquid is forced through the first check valve into the chamber,
outlet conduit means for said chamber, and means for controlling the flow of liquid through said outlet conduit means.

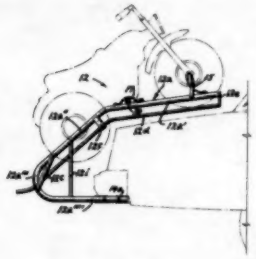
4,700,873

THREE-TIRED VEHICLE CARRIER

William A. Young, 501 E. St. Louis St., West Frankfort, Ill. 62896

Filed May 27, 1983, Ser. No. 498,720
Int. Cl.[4] B60R *9/00*
U.S. Cl. 224—42.07 **5 Claims**

1. A three-tired vehicle carrier comprising, in combination with the rear deck of an automobile having a chassis, a framework mounting said three-tired vehicle in a transporting position including a first portion selectively and releasably secured to the undersurface of said chassis of said automobile and a second portion overlying said rear deck of said automobile in a spaced apart relationship, said framework being defined by longitudinally disposed frame members in a receiving trough relationship with the front tire of said three-tired vehicle and including a member interconnecting said frame members in a selectively abutting relationship with said front tire, and lateral members extending outwardly from both sides of said frame members adapted to receive the rear tires of said three-tired vehicle in a movement blocking relationship, whereby said



arrangement serves to stabilize said three-tired vehicle in said transporting position.

4,700,874

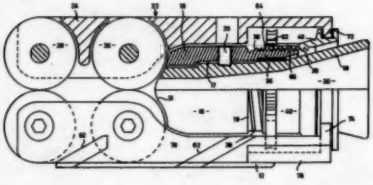
FANCY ARTEFACT BAND WITH ANNULAR DECORATIVE PORTION SURROUNDING ELONGATED CORE

Elmar Mock, Pery, and Jean-Marie Hotz, Frinvillier, both of Switzerland, assignors to ETA S.A. Fabriques d'Ebauches, Grenchen, Switzerland

Filed Mar. 26, 1986, Ser. No. 844,424
Claims priority, application France, Apr. 2, 1985, 85 05106
Int. Cl.[4] A44C *5/00*
U.S. Cl. 224—178 **12 Claims**

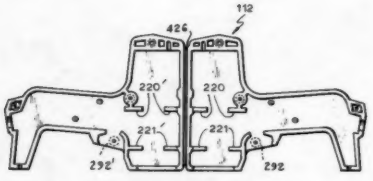
1. A band of generally elongated shape such as a wristlet for an ornamental artefact, said band comprising an elongated core portion made of a first thermoplastic plastic material having a first melting temperature, and an annular decorative portion surrounding said elongated core portion over only part of the length thereof such that a substantial part of said elongated core portion is visible, said annular decorative portion being made of a second thermoplastic plastic material having a second melting temperature equal to or greater than said first melting temperature, being molded around said elongated core portion, and being immovably bonded to said elongated core portion by a layer comprising a fused fixture of said first and second thermoplastic plastic materials.

4,700,875
ROLLER ENTRY GUIDE
Mario Fabris, 1216 S. Service Rd., P.O. Box 220, Winona, (Ont.) L0R 2L0, Canada
Filed Sep. 13, 1984, Ser. No. 650,466
Int. Cl.[4] B65H *57/14, 57/28*
U.S. Cl. 226—189 8 Claims



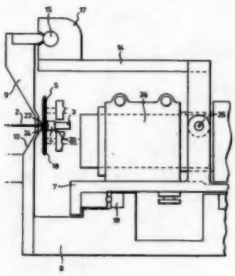
1. A roller entry guide to guide material along a longitudinal axis, said guide having a body, a pair of generally parallel roller assemblies moveably mounted on said body, each of the roller assemblies being located on an opposite side of said longitudinal axis to define a passageway for material moving along said axis, each of said roller assemblies including an arm and a roller rotatably mounted on said arm for engagement with material passing through said passageway, adjustment means acting between said roller assemblies and said body to induce relative movement therebetween and guide means comprising co-operating slides including a passageway inclined to said longitudinal axis, said slides acting between said roller assemblies and said body to guide said roller assemblies at an angle toward and away from said longitudinal axis, and inhibit rotation of said arms relative to said body, said slides maintaining said roller assemblies in a predetermined disposition relative to said longitudinal axis upon movement induced by said adjusting means to displace said roller assemblies relative to said longitudinal axis.

4,700,876
STAPLE DRIVING TOOL
Rudolf Wingert, West Milford, N.J., assignor to Arrow Fastener Company, Inc., N.J.
Filed Nov. 1, 1985, Ser. No. 794,305
Int. Cl.[4] B25C *5/15*
U.S. Cl. 227—131 12 Claims



1. A hand-held, power-driven tool, said tool having a housing and a powered driver, said driver being substantially fully contained within said housing, said housing comprising a plurality of sides, at least two of said sides being connected together by a live hinge, and means for maintaining said sides together so that said live hinge remains closed and substantially immovable during normal operation of said tool.

4,700,877
BONDING MACHINE HAVING ROTATING FICTIONAL TOOLS AND WORK CLAMPING MEANS
Ralph G. Dodds, Crowthorne, and Patrick B. Ryan, London, both of England, assignors to Luc Technologies Limited, London, England
Filed Mar. 21, 1986, Ser. No. 842,317
Claims priority, application United Kingdom, Mar. 22, 1985, 8507523
Int. Cl.[4] B23K *20/12, 37/04*
U.S. Cl. 228—2 4 Claims

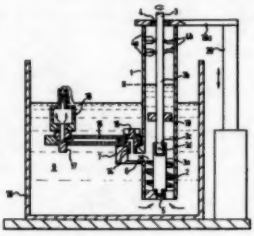


1. A machine for forming bonds between connectors and each upper and lower face of an edge of a printed curcuit board, the machine comprising:
a frame,
rotatable wheels for operating respectively at respective upper and lower faces of said printed circuit board.
means for rotatably mounting the rotatable wheels,
carriage means mounted on the frame and carrying the rotatably mounting means for moving said wheels in translation along the printed circuit board,
drive means for rotating the rotatable wheels at high speed,
means for holding the connectors adjacent to the upper and lower faces of the edge of the printed circuit board, the holding means including jaws for engaging the respective end faces and means mounting at least one of the jaws for movements into and out of the engagement, and
means for supporting the rotatably mounting means with respect to the carriage means and thereby the wheels in relation to the printed circuit board to apply a predetermined pressure by the wheels respectively onto the printed circuit board through said connectors, the means for supporting the rotatably mounting means for the wheel associated with the end face engageable by the at least one jaw being slidingly coupled to the holding means for the at least one jaw so that a positioning of the at least one jaw with respect to the end face entrains positioning of the wheel with respect to the end face.

4,700,878
SOLDERING APPARATUS
Alexander J. Ciniglio, Brentwood, England, assignor to Dolphin Machinery Limited, England
Filed Aug. 7, 1986, Ser. No. 893,980
Claims priority, application United Kingdom, Aug. 9, 1985, 8520013; Dec. 10, 1985, 8530346
Int. Cl.[4] B23K *1/08*
U.S. Cl. 228—37 5 Claims

1. A soldering apparatus comprising:
a solder bath for holding a supply of molten solder;
an applicator for applying molten solder to a workpiece; and
support means holding the applicator in the solder bath and including conduit means to conduct solder from the solder bath into the applicator, and pump means to pump solder

from the solder bath through the conduit means and towards the applicator, in which the pump means is mounted at the bottom of a tube, the conduit is connected intermediate the length of the tube arranged such that a



head of solder forms above the conduit in the tube to drive solder along the conduit to exit at the applicator, and at least one air seal disposed at the top of the tube to prevent air entering air space above the solder in the tube.

4,700,879

METHOD FOR MANUFACTURING SEMICONDUCTOR POWER MODULES WITH AN INSULATED CONTRUCTION

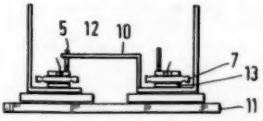
Werner Weidenauer, Lampertheim; Bernd Leukel, Weinheim, and Klaus Bunk, Worms, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 740,287

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420364; Apr. 16, 1985, 3513530

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—123 **13 Claims**



1. Method for manufacturing insulated semiconductor power modules, which comprises: presoldering a plurality of semiconductor sandwiches and a carrier unit including a metal base plate, ceramic insulating discs and connecting tabs with a high-melting solder in a first step; joining the semiconductor sandwiches and the carrier unit together with a low-melting solder in a second step; performing the first and second soldering steps without flux in a gas from the group consisting of hydrogen and forming gas; and preventing a mixture of the high-melting solder and the low-melting solder during the second step.

4,700,880

PROCESS FOR MANUFACTURING ELECTRICAL EQUIPMENT UTILIZING PRINTED CIRCUIT BOARDS

Steven L. Glover, Horse Shoe, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1986, Ser. No. 868,832

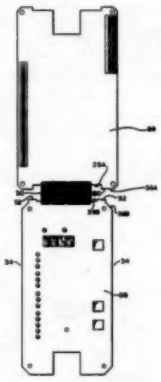
Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—180.1 **8 Claims**

1. A method for manufacturing electrical apparatus of the kind which employs two separate circuit boards which are electrically interconnected, comprising the steps of:

forming portions of a single piece of circuit board material into the general shape of both of said separate circuit boards with an area of jointure therebetween;

disposing one end of an electrical conductor on one of said joined circuit boards and the other end of said electrical conductor on the other of said joined circuit boards;



soldering said electrical conductor at both ends thereof to said joined circuit boards; and

separating said joined boards at said area of jointure after said soldering step while maintaining electrical interconnection between said boards through said conductors.

4,700,881

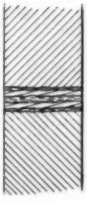
MULTIPLE FOIL TRANSIENT LIQUID PHASE BONDING

Edward J. Ryan, Wallingford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1984, Ser. No. 684,397

Int. Cl.[4] B23K *20/00*

U.S. Cl. 228—194 **6 Claims**



1. Method for reducing porosity in the joining of nickel base superalloy articles having matching surfaces between which a bond is desired including the steps of:

a. providing at least two bonding foils between the matching surfaces, each of said foils having essentially the same base composition and having boron enriched surfaces;

b. providing means to urge the matching surfaces and intervening foils together;

c. heating the articles/foil combination to a temperature at which the boron rich portions of the foils melt but the articles being joined do not melt;

d. holding the combination at said temperature for a time sufficient to permit the boron to diffuse into the article being joined thereby raising the melting point of the

melted material and causing isothermal solidification to occur

whereby the liquid region which forms between the foils provides sufficient material to feed and fill any porosity which would otherwise occur during the process if a single foil were utilized.

4,700,882

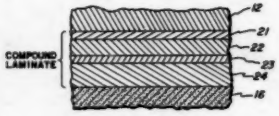
COMPOSITE ROTARY ANODE FOR X-RAY TUBE AND PROCESS FOR PREPARING THE COMPOSITE

Thomas M. Devine, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 702,160, Feb. 15, 1985, Pat. No. 4,641,334. This application Oct. 14, 1986, Ser. No. 918,455

Int. Cl.[4] B23K *20/16*

U.S. Cl. 228—19 **17 Claims**



1. The process for joining mating surfaces of a graphite member and a metal component by diffusion bonding during preparation of an anode assembly for a rotary X-ray anode, the metal of said metal component being selected from the group consisting of tungsten, tungsten alloys, molybdenum and molybdenum alloys, said process comprising the steps of:

(a) assembling a sequence of elements in a chamber, the assembled elements comprising (1) said graphite member, (2) at least one continuous layer of first metal selected from the group consisting of platinum and platinum alloys, (3) a continuous layer of second metal selected from the group consisting of vanadium and vanadium alloys and (4) said metal component, said mating surfaces being in juxtaposition;

(b) applying a stress to said assembled elements sufficient to to urge each of said elements into intimate contact with any adjacent element so as to enable the diffusion of atoms to occur therebetween;

(c) providing an atmosphere in said chamber inert to said assembled elements;

(d) heating said assembled elements while under stress to a temperature in the range of from about 1450° C. to about 1550° C.;

(e) holding said assembled elements under stress at said temperature for a period of from about 4 to about 5 minutes during which time a crack-free layer of carbide comprising carbide of vanadium and carbide of metal from said metal component forms and said assembled elements are unified;

(f) ceasing the heating to permit the unified assembled elements to cool and

(g) recovering said unified assembled elements.

4,700,883

TUBULAR PACKAGE AND END CAP FORMING COMPONENT OF SAME

Laselo Vajtay, deceased, late of Somerset, N.J. (by Stephen M. Vajtay, executor), assignor to SLM Corporation, Somerset, N.J.

Continuation-in-part of Ser. No. 729,786, May 2, 1985, abandoned. This application Jan. 7, 1986, Ser. No. 816,779

Int. Cl.[4] B65D *43/04, 43/06*

U.S. Cl. 229—125.17 **4 Claims**

1. In a tubular package comprising:

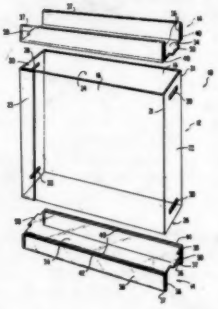
an open ended, flexible plastic sheet material tube of rectangular cross-section including laterally opposed sidewalls and longitudinally opposed end walls,

an end cap carried by said tube at an open end thereof closing off said open end,

the improvement wherein:

said end cap comprises a folded, flexible, semi-rigid plastic sheet of a heavier gauge than that of said tube and including a rectangular central portion, having opposite sides and opposite ends,

said end cap central portion being of rectangular configuration corresponding to said tube, having a length generally equal to the longitudinal distance between said end walls of said tube and a width generally equal to the lateral distance between said tube sidewalls, and having solely at said opposite sides, double folded flat sheet portions integral with said central portion, forming inner sidewalls at right angles to the central portion, and outer sidewalls folded back, towards the central portion, said inner and outer sidewalls extending generally parallel to each other,



said inner and outer sidewalls being joined by a crease defining a double layer, narrow slot generally equal to the thickness of said plastic sheet material tube sidewall, said end cap central portion being positioned internally of said tube with said tube sidewalls slidably inserted within said slot,

the end walls of said flexible plastic tube adjacent said one open end carrying said end cap including aligned, coplanar perforations, respectively, and wherein said end cap central portion includes integral tabs sized to the perforations, projecting outwardly of the opposite ends of the end caps and being received by said coplanar perforations of said tube respectively, such that the end cap automatically locks to the end of the flexible plastic material tube and the fitted engagement between the tube sidewalls and the double layer slot defining end cap sidewalls maintains the tabs within the perforations and the tab and perforation couplings maintain the tube sidewalls between said opposed folded end cap sidewalls to create a relatively stable end cap closed pacakge at low cost.

4,700,884

DISPENSING SYSTEM

John P. Barrett, 879 Harbor Island, Clearwater, Fla. 33515; Daniel R. Schulz, Crystal Beach; David E. Kent, Palm Harbor, all of Fla.; Robert J. deFasselle, Kirtland, Ohio, and Henry E. Zega, Clearwater, Fla., assignors to John P. Barrett, Clearwater, Fla.

Continuation-in-part of Ser. No. 510,750, Jul. 5, 1983, abandoned, Division of Ser. No. 428,921, Sep. 30, 1982, Pat. No. 4,409,694. This application Jan. 14, 1985, Ser. No. 691,681

Int. Cl.[4] G05D *23/185;* **E03D** *1/14*

U.S. Cl. 236—12.12 **17 Claims**

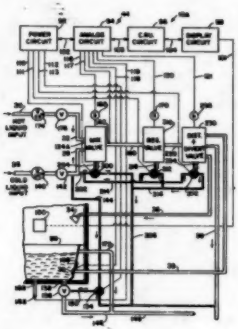
1. A system for dispensing liquid at a desired temperature

from a cold liquid pressure line and a hot liquid pressure line to a plurality of liquid outlets, comprising in combination:

valve means for interconnecting the hot liquid pressure line and the cold liquid pressure line to the plurality of liquid outlets;

said valve means including a mixing valve for mixing the hot liquid and the cold liquid from the hot liquid pressure line and the cold liquid pressure line;

said valve means including distribution valve means for



directing the mixed hot and cold liquids to one of the plurality of liquid outlets;

said valve means including a divert position for diverting liquid into a divert output; and

control means for controlling said valve means to divert liquid into said divert output until the liquid obtains a preselected temperature and for mixing the hot liquid and the cold liquid to obtain a desired temperature and for directing the mixed liquid at the desired temperature to a selected one of the plurality of liquid outlets.

4,700,885

MIXING VALVE FOR PLUMBING

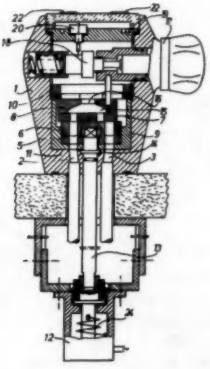
Peter Knebel, Iserlohn, Fed. Rep. of Germany, assignor to Knebel & Rottger GmbH & Co., Fed. Rep. of Germany

Filed Jun. 5, 1986, Ser. No. 870,804

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531194

Int. Cl.[4] **G05D** *23/13;* **F16K** *11/24*

U.S. Cl. 236—12.16 **11 Claims**



1. Mixing valve for plumbing comprising three ceramic valve discs with appropriate control ducts positioned parallel to one another in reciprocally watertight manner disposed in a housing having one hot water inlet and one cold water inlet and one outlet, the ceramic disc on the inlet side being a stationary bearing disc against which the second disc rests and can be rotated from outside the housing to control the amount of flow, the third disc being slidable linearly against the second disc for temperature adjustment by means of a manually adjustable thermostat operating laterally with respect to the disc axis, a rotatable motor regulator engageing the second disc and having a shaft fitting into the stationary disc in rotatable manner and connected to the second disc and the regulator being controlled by an associated electronic flow regulator.

4,700,886

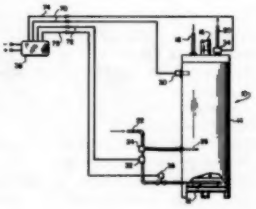
INTEGRATED, USAGE-DEPENDENT TEMPERATURE CONTROL FOR GAS WATER HEATERS

James B. McGhee; Joseph W. Egan, both of El Cajon, Calif., and Leslie C. Hill, 6683 Caminito Hermitage, La Jolla, Calif. 92037, assignors to Leslie C. Hill, La Jolla, Calif.

Continuation of Ser. No. 698,612, Feb. 6, 1985, abandoned. This application May 29, 1986, Ser. No. 868,662

Int. Cl.[4] **F22B** *35/00;* **F24H** *9/20*

U.S. Cl. 236—25 R **10 Claims**



1. An integrated, usage-dependent temperature control for gas water heaters that incorporates a gas burner and wherein the water heater incorporates a main water temperature thermostat and a thermostat control valve. wherein the improvement comprises:

a low limit transducer means for sensing the temperature of water produced by a water heater relative to a low limit and producing a low limit signal when the temperature is below the low limit,

flow transducer means for sensing water flow through said water heater and producing a water flow signal in response thereto,

means for sensing when the main water temperature thermostat is calling for heat and producing a heat demand signal in response thereto,

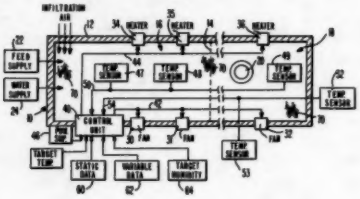
valve means downstream of the thermostat control valve means for controlling the flow of gas from the thermostat control valve to the burner, and

a controller having an input means connected to receive said low limit signal said water flow signal and said heat demand signal for commanding said valve means to permit gas flow when the temperature sensed by said low limit transducer is below the set point of said main water temperature thermostat and below said low limit or when the temperature sensed is below the set point of said main water temperature thermostat and thereafter flow is sensed by said flow transducer means.

4,700,887
ENVIRONMENTAL CONTROL SYSTEM FOR POULTRY HOUSES

Michael B. Timmons, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Dec. 29, 1986, Ser. No. 947,338
Int. Cl.[4] F24F *7/00*; G05D *21/00*
U.S. Cl. 236—49 **9 Claims**



1. A method of controlling environmental conditions in an animal enclosure having litter material on the floor thereof, to provide a maximum economic return from the growth of animals housed therein, said enclosure including a plurality of controllable ventilation fans and a plurality of controllable heaters, comprising:

determining the static parameters of the animal enclosure including size and thermal characteristics;

determining the number and type of animals to be housed in said enclosure;

determining current values of variable parameters, including current weight, heat production, air infiltration, prices of fuel, feed, electricity, and market value of animals;

assessing qualitatively the relative moisture content of the animal enclosure litter to determine whether the litter is too dry or too wet;

establishing a target relative humidity value in response to said qualitative assessment;

measuring the exterior air temperature near said enclosure to establish a dew point temperature;

measuring the interior air temperature within said enclosure;

determining, from said measured exterior temperature, dew point temperature, and target humidity, for each of a plurality of feasible interior temperatures, the ventilation rate VT required to maintain that feasible interior temperature, the ventilation rate VH required to maintain air relative humidity at a control interval value which will achieve a 24-hour average relative humidity at said target value; the expected animal growth feed consumption and operating costs at that temperature; and

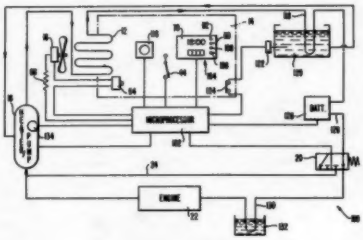
selecting and maintaining the one of said feasible interior temperatures which will produce the maximum economic return for the animals in said enclosure.

4,700,888
AUXILIARY HEATER CONTROLLER

Douglas J. Samulak, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jun. 18, 1986, Ser. No. 875,577
Int. Cl.[4] G05D *23/00*
U.S. Cl. 237—2 A **32 Claims**

1. An auxiliary heater controller for use with a liquid cooled engine comprising a first fluid circuit including said engine, a heat exchanger means, an electrically operated heater means and an electrically operated pump means, said first fluid circuit extending from said engine through a series combination including said heater means, pump means and heat exchanger means back to said engine, two-way valve means directly connected to said engine to receive fluid which has passed through said heat exchanger means, said heater means, and said pump means, said two-way valve means being formed by a single electrically operated solenoid valve, and a fluid bypass line extending from said two-way valve means around said engine to form a second fluid circuit, said second fluid circuit including said heat exchanger means, heater means and pump means, the two-way valve means being operative to direct fluid to flow in either said first or said second fluid circuit, and control circuit means connected to a power source for selectively providing power to said pump means, heater means and two-way valve means, said control circuit means including

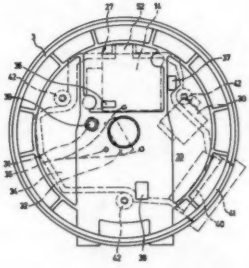


timer means connected to selectively open or close a power circuit between said power source, said heater means and said pump means and, upon closing said power circuit, to cause said two-way valve means to permit fluid flow in said second fluid circuit, said timer means having the capability of being preset to close said power circuit at a first time and to open said power circuit at a second time subsequent to said first time to cause said two-way valve means to switch fluid flow to said first fluid circuit.

4,700,889
CONNECTING DEVICE FOR POWER SUPPLY AND HEATER EQUIPPED THEREWITH

Werner Lucius, Starnberg; Ernst Mosig, Iffeldorf, and Josef Riedmaier, Pentenried, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Gaiting, Fed. Rep. of Germany

Filed Oct. 9, 1986, Ser. No. 917,220
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1985, 3536153
Int. Cl.[4] B60H *1/02*
U.S. Cl. 237—12.3 C **21 Claims**



1. Connecting device for power supply equipment, such as a combustion motor, control device, fuel pump, solenoid valve, ignition spark unit, flame monitoring device, burner nozzle assembly preheating device, and the like, in heating devices, particularly auxiliary heating devices for vehicles, characterized in that the connections and connecting devices for all said equipment is combined in a common central connecting com-

ponent which is securable to an internal flange of a heating device housing part supporting a burner unit.

4,700,890

PROTECTIVE DEVICE FOR SPRAYING APPARATUS

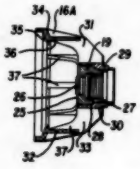
Kyohei Hasegawa, Nagaoka, Japan, assignor to Nippon Seiki Co., Ltd., Niigata, Japan

Filed Feb. 6, 1986, Ser. No. 826,914

Claims priority, application Japan, Oct. 31, 1985, 60-244995

Int. Cl.[4] B05B *1/28*

U.S. Cl. 239—103 **4 Claims**



1. In spraying apparatus having an electromagnetic driving unit and a pump housing in a main body thereof, which sucks and sprays a liquid, the improvement comprising:

a protective cover having cylindrical base means at one end thereof for receiving a nozzle therein and a cylindrical cover extending forwardly from the cylindrical base means in a spraying direction, an annular drip preventing wall protruding radially inward from an inner circumference surface at a forward end of said cylindrical cover, a liquid sump being formed on a side of said annular drip preventing wall facing the base means to sump liquid adhering to the inner circumference surface of said cylindrical cover during a spraying operation, and air passages formed at the cylindrical cover to supply air into the cylindrical cover, said passages and forward end of the cylindrical cover being arranged to define a spray pattern substantially out of contact with said drip preventing wall, and further including ribs formed radially inward on the inner circumference surface of said cylindrical cover and extending axially in the direction of liquid spray from the wall towards the base means to sump liquid from the inner circumference surface of said cylindrical cover towards said liquid sump.

4,700,891

ELECTROMAGNETICALLY ACTUATABLE FUEL INJECTION VALVE

Waldemar Hans; Wilhelm Kind, both of Bamberg; Heinrich Knapp, Leonberg; Wolfgang Kramer, Kemmern, and Rudolf Sauer, Beninngen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1986, Ser. No. 912,469

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535124

Int. Cl.[4] F02M *51/06*

U.S. Cl. 239—132.5 **19 Claims**

1. A magnetic injection valve for injection of fuel into the intake tract of a mixture-compressing internal combustion engine, comprising

a valve housing,

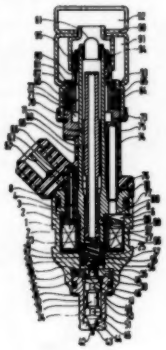
a hollow fuel-carrying core made of ferromagnetic material and secured at one end in a coil holder (2) thereby cooperating with an armature in axial alignment with said core,

a magnetic coil (2) secured on said coil holder and axially penetrated by at least part of said core and located in an interior of said valve housing through which fuel flows,

a bushing secured inside said core forming an annular gap between said bushing and said core, said bushing being sealingly mounted in said core on an end of the bushing oriented toward said armature, and

at least one opening in said core connecting said annular gap with said interior of said valve housing, said opening located on an end of said core nearer said armature,

a fuel inlet, a fuel passage that extends from said fuel inlet to said interior of said valve housing with said passage communicating with said opening in said bushing,



said annular gap permits fuel flow from said opening in said core to an upper end of said bushing through an interior of said bushing along its length to said valve needle,

and said annular gap (62) and said interior of said bushing (60) discharge at an end of said bushing remote from said armature (27), into a fuel return (92) leading away from the magnetic injection valve, whereby the interior of the bushing (60) serves as a means of fuel flow to the armature (27) and to discharge excess fuel into said fuel return.

4,700,892

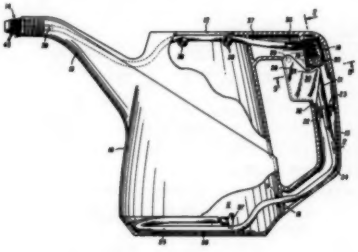
MISTING AND WATERING CAN

Joseph M. Cunning, Cohasset, Mass., assignor to Blue Mountain Products, Inc., Utica, N.Y.

Filed Oct. 10, 1986, Ser. No. 917,516

Int. Cl.[4] A01G *25/14*; B05B *15/00, 9/03*

U.S. Cl. 239—289 **9 Claims**



1. A misting and watering can comprising

a can body having a pouring spout,

a nozzle mounted in the pouring spout and having a mist discharge aperture and pouring passages surrounding said aperture and being in communication with the interior of the pouring spout, and

manual pumping means on the can body operable to deliver water from the interior of the can body to said mist discharge aperture, water from the interior of the can body

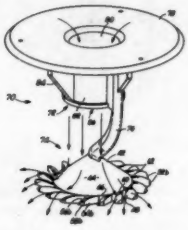
being delivered to said pouring passages of the nozzle through said spout by tilting the can body.

4,700,893

MULTIPURPOSE NON-CLOGGING NOZZLE FOR WATER COOLING TOWERS

Thomas W. Bugler, III, Prairie Village, Kans., assignor to The Marley Cooling Tower Company, Mission, Kans.

Filed Jul. 25, 1986, Ser. No. 889,479
Int. Cl.[4] B05B *1/26*
U.S. Cl. 239—498 **11 Claims**



1. A liquid distribution assembly for use in water cooling towers and comprising:

water metering means including structure presenting a metering orifice of predetermined diameter, and means for delivery of water in a generally axial manner from the orifice; and

means below said orifice for dispersing and increasing the effective surface area of the water delivered from the orifice in order to enhance cooling of the water, said water-dispersing means including

a water dispersing element having an upstanding, downwardly and outwardly diverging, generally tapered water-contacting upper surface and presenting an outer, lower, generally circular in plan configuration marginal edge,

the diameter of said element surface at said marginal edge being approximately equal to or greater than said orifice diameter and no more than about eight times said orifice diameter,

the angle of inclination of said water-contacting surface at the area thereof immediately above said marginal edge being from about 30° to about 45° with respect to the horizontal;

a plurality of elongated, stationary water-dispersing members each presenting an elongated, arcuate in cross-section water-engaging surface, an inner end and an opposed outer end; and

said members being mounted adjacent to and extending outwardly from said element marginal edge and in a substantially circular array, with the longitudinal axis of each member lying in a vertical plane intersecting the circle defined by said element marginal edge and without passing through the center of such circle, the outer ends of said members lying in and cooperatively defining a circle having a relatively large diameter,

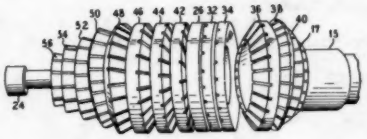
the diameter of said member-defined circle being up to about ten times greater than said orifice diameter.

4,700,894

FIRE NOZZLE ASSEMBLY

Leo J. Grzych, 8850 Parrish St., Schererville, Ind. 46375

Filed Jul. 3, 1986, Ser. No. 881,814
Int. Cl.[4] B05B *1/14*
U.S. Cl. 239—555 **16 Claims**



1. A nozzle for forming a generally sphere-like water spray pattern, said nozzle comprising:

means for coupling said nozzle to a water delivery hose for receiving water therefrom;

a plurality of rings for forming said spray pattern, which rings include:

a central ring positioned in a generally transverse attitude to the water flow direction;

a first group of nested and conically shaped rings positioned rearwardly of said central ring, the surfaces of successively rearwardly positioned rings sloping increasingly rearwardly;

a second group of nested and conically shaped rings positioned forwardly of said central ring, the ring surfaces of successively forwardly positioned rings sloping increasingly forwardly;

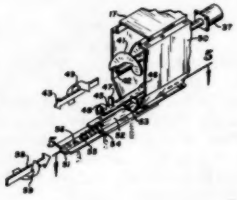
each of said first and second group of rings having a plurality of substantially radial water directing and fog forming slots, said slots having angularly shaped corner surfaces for creating turbulence; and retainer means securing said rings in stacked and assembled relation.

4,700,895

HYDRAULIC METERING CONTROL

Harry H. Takata, Minneapolis, Minn., assignor to AG-CHEM Equipment Co., Inc., Minneapolis, Minn.

Filed Dec. 2, 1985, Ser. No. 803,229
Int. Cl.[4] A01C *19/00, 3/06*
U.S. Cl. 239—664 **6 Claims**



1. In an apparatus for field application of particulate solids from an elongated boom carried on a wheeled vehicle including a supply hopper, first conveying means for delivering solids at a controlled rate from the supply hopper to a receiving zone at the inboard end of said elongated boom, second conveyor means for moving material from said receiving zone and along the length of said elongated boom, said apparatus being characterized in that:

(a) said elongated boom includes upper and lower generally superposed enclosed particulate solid transfer ducts, said upper duct being in communication with said receiving zone and having a boom conveyor therein for moving particulate solids from said receiving zone outwardly along said upper duct, said upper duct having a plurality

of axially spaced openings formed along the base thereof and providing a communication path for particulate solids from said upper duct to said lower duct;

(b) said lower duct comprising a metering duct and having a metering screw mounted for axial rotation therewithin to move particulate solids along an axial direction inwardly of said elongated boom and counter to the direction of movement of solids in said upper duct;

(c) a plurality of openings formed in said lower duct for metered rate release of said particulate solids therefrom; and

(d) drive means for rotating said metering screw at a predetermined controlled rate, said drive means including a hydraulic motor, pump means having a variable output capacity for driving said hydraulic motor, said pump means having drive means operatively coupled to a drive shaft of said vehicle for maintaining the drive rate of said pump means proportionate to the speed of said vehicle, and control means accessible to the operator for controllably adjusting the output of said pump means to said hydraulic motor so as to adjust the rate of rotation of said metering screw.

4,700,896

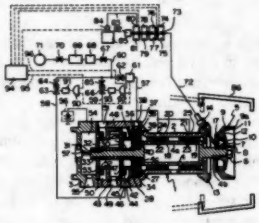
ROTARY TYPE ELECTROSTATIC SPRAY PAINTING DEVICE

Hitoshi Takeuchi, and Shogo Ooishi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 11, 1986, Ser. No. 850,745

Int. Cl.[4] B05B *5/04*

U.S. Cl. 239—693 **15 Claims**



1. A rotary type electrostatic spray painting device comprising:

a housing;

a rotary shaft rotatably arranged in said housing and having an inner end portion and an outer end portion;

a spray head fixed to said outer end portion of said rotary shaft and having a cup shaped inner wall;

a paint injection nozzle for feeding a paint onto said cup shaped inner wall;

at least two color valves connected to said paint injection nozzle for controlling the paint injecting operation from said paint injection nozzle;

paint suction means for sucking paint remaining in said paint injection nozzle;

means for generating a negative high voltage and applying said negative voltage to said spray head;

static pressure air bearing means arranged in said housing and supporting said rotary shaft in a non-contact state;

turbine wheel means fixed to said inner end portion of said rotary shaft;

a first air injection nozzle injecting pressurized air towards said turbine wheel means to rotate said rotary shaft in one direction;

a second air injection nozzle injecting pressurized air towards said turbine wheel means to provide a rotational force in another direction for said rotaty shaft and reduce a speed rotation of said rotary shaft;

an air source producing pressurized air;

a first air supply conduit interconnecting said air source to said static pressure air bearing means;

a second air supply conduit interconnecting said air source to said first air injection nozzle;

first valve means arranged in said second air supply conduit;

a third air supply conduit interconnecting said air source to said second air injection nozzle;

second valve means arranged in said third air supply conduit; and control means for controlling the opening operation of said first valve means and said second valve means and controlling the sucking operation of said paint suction means to open said first valve means; close said second valve means; and stop the sucking operation of said paint suction means when the painting operation is carried out, and to close said first valve means, open said second valve means, and carry out the sucking operation of said paint suction means when changing the paint color.

4,700,897

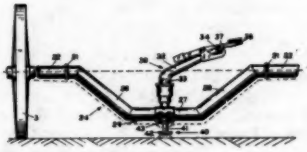
LONG REACH DROPPED WHEEL-LINE IRRIGATION SYSTEM

Alvin D. Smith; Darin E. Smith, both of HC 79, Box 2175, and Reed R. Smith, HC 79, Box 2160, all of Oreana, Id.

Filed Jul. 14, 1986, Ser. No. 885,177

Int. Cl.[4] A01G *25/09;* **B05B** *3/04, 3/18, 15/06*

U.S. Cl. 239—741 **10 Claims**



9. Wheel line irrigation apparatus comprising:

a plurality of laterally spaced wheels;

an elongated pipeline suspended by and between said wheels, said pipeline defining a main line, having a substantially horizontal longitudinal axis, and a plurality of dropped lines located between and in fluid communication with adjacent portions of said main line to which they are attached; and

a plurality of sprinklers, each of said sprinklers mounted on the top of a respective one of said dropped lines, each of the sprinklers being of the impact type for rotation and each of the sprinklers having a single primary nozzle having an inlet port and a discharge port, said discharge port being at least 0.5 inches in diameter and said inlet port of each of said nozzles being located at or below the longitudinal axis of adjacent main line portions of said pipeline to which each of said dropped lines are affixed for reducing torque on said pipeline; and

a plurality of pedestals downwardly depending from a respective one of said dropped lines for supporting said respective dropped line when said dropped line is filled with water and for transmitting impact energy from each of said sprinklers to ground for reducing oscillation of said pipeline.

4,700,898

CONCENTRATION OF SILICON CARBIDE

Rémi Tremblay, 350 avenue des Peupliers, Quebec, Canada G1P 3W8

Filed May 8, 1986, Ser. No. 861,066

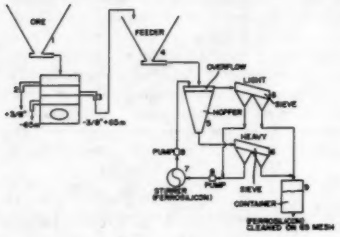
Int. Cl.[4] B02L *23/12, 21/00*

U.S. Cl. 241—14 **20 Claims**

1. A process for concentrating silicon carbide which comprises the following steps:

(a) crushing a starting material containing silicon carbide under conditions capable of releasing free carbon and of freeing silicon carbide;

(b) screening the crushed product to separate a rejected fraction and to remove particles of undesirable granulometries and then passing said removed particles to ovens;



(c) introducing said rejected fraction into a high density medium, and separating said rejected fraction in a high density medium into a heavy fraction and a light fraction;

(d) recovering said heavy fraction having a high concentration of silicon carbide and recycling said light fraction to silicon carbide producing ovens.

4,700,899

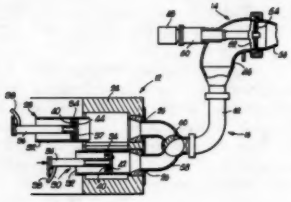
CONTINUOUS VACUUM GRINDING METHOD AND APPARATUS

Richard G. Powers, Overland Park; Warren R. Schack, Leawood, both of Kans.; Lewis F. Alley, Kansas City, Mo., and James E. Anderson, Shawnee Mission, Kans., assignors to Marlen Research Corporation, Overland Park, Kans.

Filed Oct. 18, 1985, Ser. No. 788,765

Int. Cl.[4] B02C *18/22, 18/30*

U.S. Cl. 241—30 **4 Claims**



1. In apparatus for grinding of products including a pumping means for delivering a stream of product to be ground, grinding means including an apertured grinder plate downstream of said pumping means for receiving said product stream and grinding the same, and conduit means operatively coupling the pumping means and grinding means, the improvement which comprises:

said pumping means including structure for forming a chamber which can be closed to the entrance of ambient air, means for substantially filling the chamber with meat, mechanical means for closing the meat-filled chamber to the entrance of ambient air and for isolating said chamber from said grinder plate, and means for removing entrapped air within the closed, meat-filled chamber; and

said conduit means being imperforate for continuously maintaining said product in said deaerated condition until ground product is expelled from said grinding means.

4,700,900

TWO STAGE REFINER

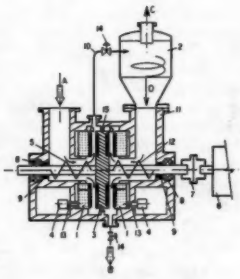
Stephen A. Rowland, Montreal, Canada, assignor to Hymac Ltd., Quebec, Canada

Continuation of Ser. No. 588,980, Mar. 13, 1984, abandoned. This application Dec. 17, 1985, Ser. No. 808,686

Claims priority, application Canada, Oct. 24, 1983, 439565

Int. Cl.[4] B02C *7/14*

U.S. Cl. 241—37 **8 Claims**



1. A refiner for the two-stage production of pulp from unrefined material comprising wood chips comprises of:

(a) a single housing having two refining zones;

(b) a rotor fixedly mounted on a rotatable shaft for rotation therewith, said rotor positioned between opposing supported ends of said shaft and including opposing grinding surfaces;

(c) a first stator in opposing relation to one grinding surface of said rotor in a first refining zone and a second stator in opposing relation to the opposing grinding surface of said rotor in a second refining zone;

(d) means to measure the relative power consumption in each refining zone associated with the grinding of material which occurs by cooperation of said stators and said rotor in each refining zone;

(e) means to independently advance or retract said first and second stators either toward or away from said opposing grinding surfaces to vary both the clearance between said stators and said rotor and the axial load in each refining zone to maintain a desired power consumption in each refining zone;

(f) conveyor means to feed unrefined wood chips between said first stator and said rotor whereby gaseous by-products are produced and said wood chips are partially refined;

(g) separation means to separate said gaseous by-products from said partially refined wood chips; and

(h) conveyor means to feed said partially refined wood chips subsequent to separation of said gaseous by-products between said second stator and said rotor whereby said partially refined wood chips are further refined.

4,700,901

FOOD PROCESSORS

John W. McClean, Lakemba, Australia, assignor to Breville R & D Pty. Limited, New South Wales, Australia

Filed Jul. 31, 1986, Ser. No. 891,281

Claims priority, application Australia, Aug. 19, 1985, PH02018

Int. Cl.[4] B02L *18/12*

U.S. Cl. 241—37.5 **3 Claims**

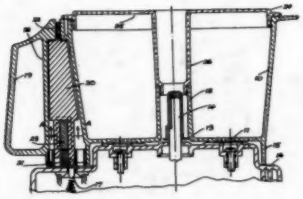
1. A substantially cylindrical food processing container for a food processor, said container comprising:

a container bowl having an axis and a bottom, said container

bowl being removably attachable to an upper surface of a base of a food processor;

a sleeve projecting upwardly from the center of said bottom of said container bowl, said sleeve being open at its upper end and surrounding a hole through which a driving motor shaft of a food processor can project;

a switch actuating member connected externally of said container bowl and movable in a direction sub-stantially parallel to said axis of said container bowl, said switch actuating member actuating an electric switch means of a



food processor when the container is attached to a food processor, upon movement of said switch actuating member in the direction of the food processor;

resilient means for resisting movement of said switch actuating member in the direction of a food processor, said resilient means comprising a block of silicone rubber, the temperature of said silicone rubber not varying significantly when subjected to radiation in a microwave oven, said switch actuating member and container also being made of material substantially unaffected by radiation in a microwave oven.

4,700,902

DOCUMENT SHREDDING MACHINES

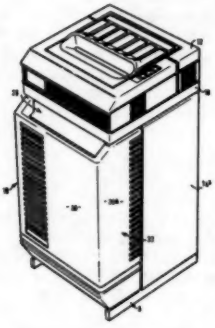
James T. Yeomans, Birmingham, United Kingdom, assignor to Ofrex Group Holdings PLC, West Drayton, United Kingdom

Filed Dec. 13, 1985, Ser. No. 807,973

Claims priority, application United Kingdom, Dec. 13, 1984, 8431429

Int. Cl.[4] B02C *23/00*

U.S. Cl. 241—100 **6 Claims**



1. A base unit for a document shredding machine, comprising an open-fronted supporting structure which comprises side walls and which provides a support surface on which a document shredding machine may be mounted, and a container comprising a rear portion having side walls and a rear wall extending between the side walls, and a front portion having side walls and a front wall extending between the side walls, the front portion being wider than the rear portion such that, when the container is placed in an operative, in-use position, the side walls of the rear portion lie between the side walls of the supporting structure.

4,700,903

FOOD PROCESSOR WITH ADAPTERS FOR TRANSMISSION OF TORQUE TO ROTARY TOOLS

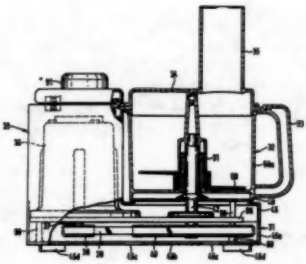
Stefan Henn, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany

Continuation of Ser. No. 708,352, Mar. 5, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 926,864

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408692

Int. Cl.[4] B02C *18/12*

U.S. Cl. 241—101.2 **25 Claims**



1. A food processor for use with a tool having an internal coupling device, comprising a housing; an electric motor in said housing; a bowl removably mounted in said housing and having an interior and a main portion including a bottom wall provided with a tubular extension in the interior of said bowl; a rotary tool spindle journalled in said housing and surrounded by said extension; means for insulating said spindle in said extension; means for transmitting rotary motion from said motor to said spindle; a tubular adapter disposed in said bowl and having an outer member with at least one external coupling device arranged to mate with the internal coupling device of the tool which is to be driven by said adapter, and an inner member rotatable with said outer member; and means for transmitting torque from said spindle to said adapter, said torque transmitting means comprising coupling means for allowing said adapter to rotate with said spindle, said coupling means including at least one first coupling element carried by said spindle and at least one second coupling element provided on said inner member and cooperating with said first coupling element, said second coupling element being movable relative to said first coupling element and relative to said insulating means so as to allow for separation of said adapter from said first coupling element.

4,700,904

METHOD FOR PREVENTING YARN TAIL BREAKAGE DURING YARN WINDING

Antonio Martinez, Gastonia, N.C., assignor to Conitex, Inc., Gastonia, N.C.

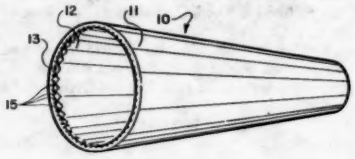
Division of Ser. No. 798,599, Nov. 15, 1985. This application Oct. 20, 1986, Ser. No. 920,461

Int. Cl.[4] B65H *54/02, 75/10, 75/28*

U.S. Cl. 242—18 R **8 Claims**

1. A method of preventing breakage of yarn tails on textile yarn carriers occasioned by relative movement between a rotatably-mounted plate on which the carrier is mounted by insertion of the plate in one end thereof, comprising the steps of:

(a) placing the yarn tail across the end of the carrier;
(b) engaging the tube with the plate so as to grip the yarn tail between the carrier and the plate so as to prevent the yarn from being pulled free of engagement upon rotation of the carrier;
(c) providing yarn protection means for the yarn at at least



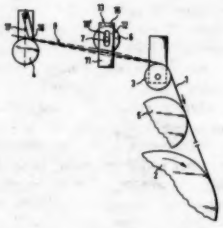
one point thereon in the area of contact between the carrier and the plate; and
(d) cradling and gripping the yarn around a portion of its circumference by said protection means to prevent breakage of the yarn by relative movement between the carrier and the plate occasioned by starting and stopping the rotation of the carrier.

4,700,905

ARRANGEMENT FOR TAPE WINDING MACHINES FOR THE COMPENSATION OF A UNILATERAL TAPE TENSION

Herbert Oppelt, Frensdorf, and Rufolf Lechner, Stegaurach-Kreuzschun, both of Fed. Rep. of Germany, assignors to MWB Messwandler-Bau AG, Bamberg, Fed. Rep. of Germany

Continuation of Ser. No. 760,939, Jul. 31, 1985, abandoned. This application Jan. 14, 1987, Ser. No. 6,349
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1984, 3428707
Int. Cl.[4] B65H *17/02, 23/16*
U.S. Cl. 242—67.1 R **25 Claims**



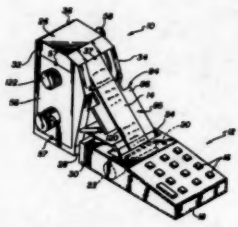
1. An arrangement for tape winding machines to compensate for a unilateral tape tension of tapes to be wound with a desired slope or overlap, comprising a transfer roller means on a feeding side, a delivery surface means fixed during winding on a delivery side, a compensating roller means arranged between said transfer roller means and said delivery surface means, as viewed in the direction of movement of the tape, and resting on tape extending under tension in a plane between said transfer roller means and said delivery surface means without significantly pressing through the plane, said compensating roller means being of a sufficient weight and freely movably supported in a guide means in such a manner that the axis of the rotation of the compensating roller means is able to incline from its position parallel to said plane formed between the transfer roller means and the delivery surface means and is thereby able to twist the tape to compensate for the unilateral tape tension.

4,700,906

PAPER TAPE CONTROL UNIT

Theodore P. Lapadakis, 9827 Mason Ave., Chatsworth, Calif. 91311

Filed Mar. 19, 1987, Ser. No. 28,191
Int. Cl.[4] B65H *16/06, 18/14*
U.S. Cl. 242—67.3 R **20 Claims**



1. A paper tape control unit adapted for use with a business machine or the like having means for drawing and using an elongated strip of paper tape, said control unit comprising:
a control unit housing;
a supply reel carrying a roll of paper tape in elongated strip form supply to the business machine;
a take-up reel for rewinding of the paper tape from said supply reel;
means for supporting said supply and take-up reels for rotation within said housing, said supply reel being positioned for drawing of said paper tape thereon into association with the business machine by operation of said drawing means for use of said paper tape by said business machine, said supply reel being rotatably driven by said drawing means as said paper tape is drawn from said supply means, and said take-up reel being positioned for rewinding thereonto of said paper tape used by said business machine;
drive means coupled between said supply and take-up reels such that rotational driving of said supply reel correspondingly rotatably drives said take-up reel for rewinding of said paper tape thereonto; and
a lock assembly on said housing for releasably locking said supply reel against rotation, said drive means having sufficient slippage to permit manual rotation of said take-up reel when said supply reel is locked against rotation to permit withdrawal and review of a portion of said paper tape rewound onto said take-up reel and subsequent manual rewinding of said paper tape portion onto said take-up reel.

4,700,907

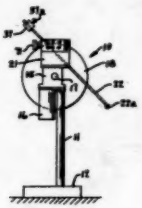
STOCK ADVANCING APPARATUS WITH CONTROL ARM DAMPING

Richard D. Nordlof, 3312 Crest Rd., Rockford, Ill. 61107

Filed Mar. 13, 1987, Ser. No. 25,606
Int. Cl.[4] B65H *59/00*
U.S. Cl. 242—75.5 **17 Claims**

1. A stock advancing apparatus for advancing flexible stock to or from a stock processing machine comprising, support means, rotary stock advancing means on the support means, a drive motor for driving the stock advancing means, a stock loop control arm mounted on the support means for swinging movement about a control arm axis, said stock loop control arm being adapted to engage a loop of stock intermediate the stock advancing apparatus and the stock processing machine and to be moved upwardly thereby through a range of control arm positions, means responsive to movement of the control

arm about the control arm axis for controlling operation of the drive motor to maintain a loop in the stock between the stock-advancing apparatus and the stock processing machine, means for damping movement of the stock loop control arm about said control arm axis, said damping means including control arm cam means mounted for turning movement with the control arm about the control arm axis, cam follower means operatively engaging said control arm cam means, and spring means



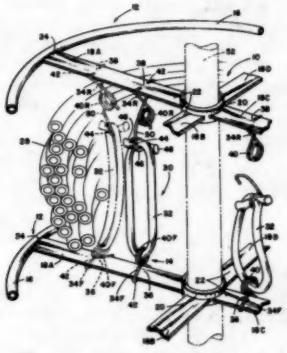
engaging said cam follower means for pressing the cam follower means against the control arm cam means, the control arm cam means and the cam follower means and the spring means being constructed and arranged to apply torque to the control arm in a direction to oppose upward movement of the control arm and which increases as the control arm moves upwardly through at least a portion of said range of control arm positions and decreases as the control arm moves downwardly.

4,700,908

STORAGE REEL WITH SELF-ADJUSTING HUB FOR PRECOILED GOODS

Michael D. Easter, 840 J. Street, Penrose, Colo. 81240

Filed May 5, 1986, Ser. No. 859,418
Int. Cl.[4] B65H *75/22, 75/24, 75/40*
U.S. Cl. 242—86.4 **10 Claims**



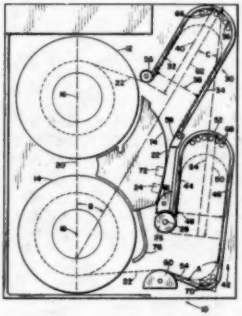
1. The hubless reel for the storage of precoiled lengths of tubing and the like which comprises: a pair of generally circular rigid hoops and at least three elongate radially-extending spokes within each hoop, said spokes each having remote ends connected to the hoop and adjacent ends connected together at the center thereof, said spokes and hoops cooperating with one another to produce a pair of substantially identical reel flanges; and, coil supporting means for detachably connecting said flanges together in transversely-spaced relation, said means comprising a first connector means mounted on the spokes of one of said flanges for adjustable movement therealong between the end thereof, a second connector means mounted on the spokes of the other of said flanges for movement therealong between the ends thereof, an elastic member attached to one of said first and second connector means and detachably connectable to the other of said connector means when they are positioned in generally opposed relation to one another, said first and second connector means together with the elastic member therebetween cooperating with one another when thus interconnected to define radially-adjustable subassemblies effective to support the inside of a coil of precoiled material positioned between the flanges upon being adjusted radially outward thereagainst while simultaneously biasing said flanges into contact with the sides thereof.

4,700,909

TAPE DECK HAVING IMPROVED TAPE PATH

Marold H. Lohrenz; Joel O. Thies, both of Tulsa, and Scott T. Jednacz, Bixby, all of Okla., assignors to Telex Computer Products, Inc., Tulsa, Okla.

Filed Sep. 6, 1983, Ser. No. 529,280
Int. Cl.[4] G03B *1/04;* **G11B** *15/58*
U.S. Cl. 242—182 **5 Claims**



1. In a magnetic tape handling system including having a vacuum source and a capstan drive means, an improved tape deck comprising:

a machine reel for receiving tape wound thereon;

a file reel having tape wound thereon, the axes of said machine and file reels lying in a vertical plane;

a first vacuum column having a first sidewall and a paralleled second sidewall, having a semi-circular wall closing one end, the other end being opened, at least one vacuum port communicating with the first column adjacent the semi-circular end wall;

a tape roller at the outer end of said first vacuum column first sidewall;

a second vacuum column having a first sidewall and a paralleled second sidewall, having a semi-circular wall closing one end, at least one vacuum port communicating with said second column adjacent said semi-circular end wall, the second sidewall being of length longer than said first sidewall, and a transverse end wall extending from said second sidewall at the end thereof opposite said semicircular wall, the outer end of said transverse sidewall and the end of said first sidewall forming a side opening into said second vacuum column, at least one vacuum port being positioned adjacent the intersection of said second column second wall and said transverse wall;

a capstan at the end of said second vacuum column first sidewall, the peripheral surface of said capstan being substantially coincident with the plane of said second vacuum column first sidewall, tape being extended from said file reel, within said first vacuum column, past said capstan, within said second vacuum column and to said machine reel; and

a first hydrodynamic bearing at the outer end of said first vacuum column second sidewall;

a second hydrodynamic bearing, positioned between said capstan and said first hydrodynamic bushing, a portion of the tape path lying in a plane from said second hydrodynamic bearing and said first hydrodynamic bearing, such tape path plane and the plane of said first column second sidewall intersecting at an obtuse angle;

a head having an active surface positioned to slightly deflect tape in the position of the tape path from said first to said second hydrodynamic bearing whereby tape moving in such tape path engages the head;

a third hydrodynamic bearing at the outer end of said transverse end wall; and

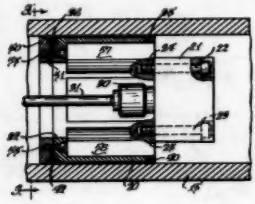
at least one vacuum port communicating with said second column adjacent the intersection of said second column second sidewall and said transverse wall.

4,700,910

STRUCTURE AND METHOD FOR MOUNTING AN AIRCRAFT WEIGHT SENSOR WITHIN TUBULAR AXLE OF AN AIRCRAFT UNDERCARRIAGE

Arthur R. Brady, Redmond, Wash., assignor to Sundstrand Data Control, Inc., Rockford, Ill.

Filed Jan. 9, 1985, Ser. No. 689,950
Int. Cl.[4] B64D *47/00*
U.S. Cl. 244—1 R **1 Claim**



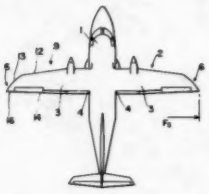
1. A mounting for an inclinometer or the like for placement thereof within a tubular axle of an aircraft undercarriage comprising, in combination, a tubular axle having an internal diameter, a cylindrical mounting member within the tubular axle and having an outer diameter less than the internal diameter of the tubular axle to provide a radial clearance therebetween, a first O-ring surrounding said cylindrical mounting member adjacent an end thereof and extending beyond the surface thereof to provide a radial compression resulting from endwise insertion of the cylindrical mounting member in the tubular axle, a rectangular annular peripheral groove adjacent the opposite end of the cylindrical mounting member, said groove being formed between an end face of the cylindrical mounting member and a detachable annular clamping ring which abuts said end face, a second O-ring positioned in said groove and having a relaxed diameter greater than the width of said groove, and means on the cylindrical mounting member for drawing said annular clamping ring against said end face to reduce the width of the groove to less than the diameter of the second O-ring to induce a radial compressive force between the tubular axle and the cylindrical mounting member.

4,700,911

TRANSVERSE DRIVING BODIES, PARTICULARLY AIRPLANE WINGS

Herbert Zimmer, Friedrichshafen, Fed. Rep. of Germany, assignor to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

Continuation of Ser. No. 347,222, Feb. 9, 1982, abandoned, which is a continuation of Ser. No. 116,562, Jan. 29, 1980, abandoned. This application Jan. 22, 1985, Ser. No. 665,443
Int. Cl.[4] B64C *3/10*
U.S. Cl. 244—35 R **4 Claims**



1. An aircraft wing comprising:

a basic wing part, having a leading edge and a trailing edge and being essentially of unswept configuration;

wing tip means for extending the span of the basic wing part so as to increase the aspect ratio as compared with a wing contoured as the basic wing part with similar wing area, the wing tip means being significantly shorter than the basic wing part, and being of triangular design with a swept back leading edge having an angled of about half a right angle in relation to the wing span direction, said angle being larger than an angle between the leading edge of the basic wing part and the direciton of the wing span, the wing tip means extending in span direction for about a chord length of the wing at the junction between the basic wing part and the wing tip means;

the wing section camber of said wing tip means increasing at least over a portion of the extension thereof from the basic wing aprt to the tip of the triangular wing tip means; and

the local zero lift direction of the wing tip means remaining constant beginning at the junction cross-section between the basic wing part and the wing tip means.

4,700,912

LASER ILLUMINATION SYSTEM FOR AIRCRAFT LAUNCH AND LANDING SYSTEM

Marshall J. Corbett, East Northport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 24, 1986, Ser. No. 855,303
Int. Cl.[4] B64F *1/00*
U.S. Cl. 244—63 **10 Claims**

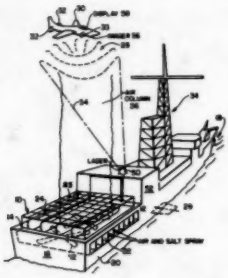
1. In a system for assisting an aircraft to vertically take off and land in a preselected area, the system having:

means for generating a column of air having a centrally depressed pressure distribution across the top thereof for capturing an aircraft on the column;

means for controlling the height of the column thereby enabling an aircraft to be raised or lowered to the preselected area by the air column;

a column illuminator comprising:

means for seeding the air column with a crystalline material; and



means for causing resonant excitation of the crystalline material thereby radiating detectable energy from the column which defines the column boundaries.

4,700,913

CABLE HOLDER FOR USE IN A VEHICLE BODY

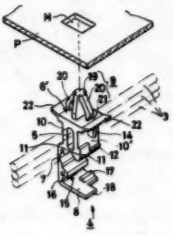
Seiji Hirano, and Youji Sato, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima and Nifco Inc., Yokohama, both of, Japan

Filed Oct. 4, 1985, Ser. No. 784,544

Claims priority, application Japan, Oct. 11, 1984, 59-152253[U]

Int. Cl.⁴ F16L *3/08*

U.S. Cl. 248—73 **5 Claims**



1. A cable holder for laying cables along the lower surface of a panel or the like, comprising a retaining body having an upper wall and a pair of depending walls defining an axially elongated substantially U-shaped retaining groove having a lower open end for retaining cables therein, a head extending upright from the upper wall of said retaining body and being engaged in a mounting hole formed in said panel or the like, said pair of depending walls having inner stopper ridges adjacent said lower open end spaced at a distance substantially smaller than the transverse dimension of the remainder of said retaining groove for preventing the cables from escaping from said lower open end of said U-shaped groove, an arm portion united via a hinge to one of said pair of depending walls for closing the lower open end of said U-shaped groove, said hinge being positioned on said one depending wall axially outwardly of said stopped ridges in a direction away from said head so that said spacing of said stopper ridges and their resulting retention of cables inserted into said retaining groove are independent of the hinged motion of said arm portion, and locking means provided on the leading end of said arm portion and on an outer surface of the other of said pair of depending walls for locking said arm portion and the other of said of depending walls.

4,700,914

ONE LEGGED STOOL

Donald O. Cheetham, Pershore, United Kingdom, assignor to G&C Home & Leisure Supplies Limited, Pershore, United Kingdom

Filed Feb. 19, 1986, Ser. No. 830,869

Claims priority, application United Kingdom, Feb. 19, 1985, 8504182

Int. Cl.⁴ A45D *19/04*

U.S. Cl. 248—155.1 **7 Claims**

1. A stool having a leg and a saddle-like seat at its upper end, the seat having a recessed boss underneath to embrace the upper end of the leg and through which a pivot pin extends, the seat being pivotable between generally horizontal and vertical attitudes when the leg is upright, and a spring-loaded plunger in the upper end of the leg, the seat having a detent to receive the plunger when horizontal and thereby be retained in that attitude, and the boss having a hole to receive the plunger when the seat is vertical, thereby to retain it in that attitude, the plunger being disengageable by pressing its end exposed in this hole.

4,700,915

TABLE LEG ASSEMBLY AND METHOD OF ASSEMBLING SAME

Edmund Killian, Merrick, N.Y., assignor to Finkel Outdoor Products, Inc., New York, N.Y.

Filed Nov. 10, 1986, Ser. No. 928,792

Int. Cl.⁴ F16M *11/20*

U.S. Cl. 248—188.1 **12 Claims**

1. A table leg assembly comprising:

two pairs of leg members, each leg member having one end portion for resting on the floor, another end portion for supporting a table top and an intermediate portion;

leg connecting means comprising two connecting members each having a given length and at least a pair of diametrically opposed indentations each configured to slidably receive the intermediate portion of each leg member;

wherein one pair of leg members has the intermediate portions thereof fixedly connected to one of the connecting members and the other pair of leg members has the intermediate portions thereof fixedly connected to the other connecting member; and

wherein the one connecting member is disposed a first distance from the floor when the one end portions of the one pair of leg members are resting on the floor and the other connecting member is disposed the first distance plus at least the given length from the floor when the one end portions of the other pair of leg members are resting on the floor;

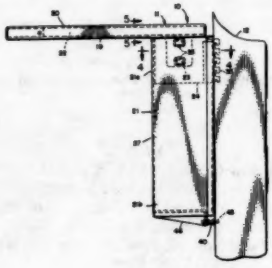
whereby the leg members are assembled by disposing the other connecting members over the one connecting member with the intermediate portions of the one pair of leg members sliding through the pair of indentations in the other connecting member and the intermediate portions of the other pair of leg members sliding through the pair of indentations in the one connecting member until the other connecting member contacts the one connecting member.

4,700,916

CANTILEVER ARM ASSEMBLY FOR MODULAR FURNITURE

John M. Bastian; David C. Pflieger, both of Two Rivers, and Marshall K. Beck, Manitowoc, all of Wis., assignors to Hamilton Industries, Inc., Two Rivers, Wis.

Filed Jun. 5, 1986, Ser. No. 870,888
Int. Cl.[4] F16B *2/18*
U.S. Cl. 248—225.2 13 Claims



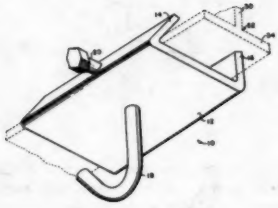
1. In combination with a standard having a multiplicity of uniformly-spaced slots arranged in a vertical series along at least one side thereof, a cantilever arm assembly comprising a generally horizontal support arm and a vertically-elongated mounting member secured to said support arm and having an upper end portion provided with a vertical series of outwardly and downwardly projecting hooks, said hooks being received in slots of said standard for latching engagement therewith and being disengagable from said standard by first lifting said mounting member and then moving said hooks outwardly from said slots, said vertically-elongated mounting member having a major proportion of its vertical length disposed below said series of hooks anad terminating in a lower end portion spaced above the bottom of said standard, and positive locking means provided at said lower end portion of said mounting member, said locking means being shiftable between a locking position, in which said means enters one of said slots for blocking upward movement of said mounting member and thereby preventing unlatching of said hooks, and a releasing position wherein said means is retracted from said slot and permits upward unlatching movement of said hooks, means whereby said hooks being are slightly loosely received in said slots when said locking means is in its releasing position, said locking means being forceably engagable with said standard to urge the lower end portion of said mounting member in a direction away from said standard and thereby force the uppermost and lower-most hooks of said series into tighter frictional engagement with said standard.

4,700,917

ADJUSTABLE LOAD BINDING HOOK

John S. Dillman, 220 Athol Ave., Apt. 205, Oakland, Calif. 94606

Filed Sep. 15, 1986, Ser. No. 907,399
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—228 3 Claims



1. An adjustable load binding hook comprising

a support beam having a flange and a web, said support beam web attached substantially perpendicular to said support beam flange longitudinally along the length thereof and substantially at the midpoint of the width thereof,

a generally rectangular base support member,

a first base support flange integral with and projecting from said base support member along one side thereof and sloping downwardly toward said base support member to define a fixed, predetermined acute angle ranging from 60 to 85 degrees with respect to said generally rectangular base support member,

a second base support flange integral with and projecting from said support member and sloping inwardly toward said base support member and toward said first base support flange along the side of said base support member opposite said first base support flange to define a fixed, predetermined acute angle ranging from 60 to 85 degrees with respect to said generally rectangular base support member,

the distance between said first base support flange and said second base support flange, as defined by the point of intersection of the inside of said first base support flange and said base support member and the point along the inside surface of said second base support flange nearest said intersection, is slightly greater than the width of said support beam flange, and

the distance between the edges of said first and second base support flanges distal said base support member is slightly less than the width of said support beam flange,

a hook attached to said base support member and projecting therefrom in a direction opposite said first and second base support flanges, the plane of said hook disposed parallel to the line of intersection said first and second base support flanges makes with said base support member, and

means for connecting said base support member to said support beam comprising

means connected to said first base support flange and bearing against the web of said support beam for forcing the edge of said support beam flange against the inside corner of the intersection of said second base support flange and said generally flat rectangular base support.

4,700,918

HAND RAIL

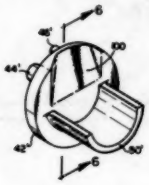
John Andrasko, Jr., 4745 Palo Verde Dr., Boynton Beach, Fla. 33435

Continuation-in-part of Ser. No. 797,622, Nov. 13, 1985, Pat. No. 4,653,714. This application Jul. 22, 1986, Ser. No. 888,925

The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.

Int. Cl.[4] A47H *1/14*

U.S. Cl. 248—251 **11 Claims**



1. A hand rail assembly for use in a space between opposing surfaces, the assembly comprising:

substantially rigid rod means adapted to be grasped as a hand rail;

rod support means for each end of the rod means, mounted opposite one another on the opposing surfaces, each of the rod support means having affixed on one side at least one surface engagement projection for engaging a complimentary depression in the surface to prevent movement of the rod support means along the surface;

each rod support means having, on an opposite side from the surface engagement projections, rigid channel means for positively positioning the rod means between the rod support means, and at least one of the rod support means having bevel structure extending outwardly toward the rigid channel means from the periphery of the rod support means, whereby the beveled surface acts to tightly wedge the rod means in the rigid channel means and between the rod support means; and,

locking fitting means for locking the ends of the rod means to the rod support means, whereby the rod support means enable the rod means to function as a hand rail and the rod means locks the rod support means in place.

4,700,919

CONNECTOR ASSEMBLY FOR WINDSCREEN ACCESSORIES

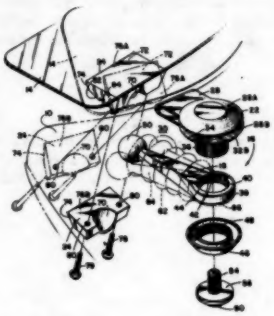
Charles A. Saunders, IV, Post Office Box 1246, Columbus, Nebr. 68601

Filed Apr. 17, 1985, Ser. No. 724,014

Int. Cl.[4] E04G *3/00*

U.S. Cl. 248—288.5 **17 Claims**

1. The mounting assembly for adjustably connecting accessories to an edge of a windscreen which comprises: a non-invasive adhesive-faced clamshell-type connector having a pair of leaves joined by an integrally formed hinge member and clampable to an edge of a windscreen; peripherally-toothed cylindrical post-forming means depending from said clamshell-type connector; at least one rigid arm having a ball on one end and an internally-ribbed expandable ring on the other end thereof sized and adapted to fit over the post-forming means and cooperate therewith to permit incremental relative rotational movement therebetween with an inhibited ratchet-like action while assembled; and a socketed connector mounted on the ball for limited universal movement, said connector including means for attaching same to an accessory which is to be both tilted and swung in an arc relative to the windscreen.



4,700,920

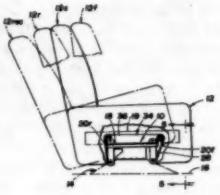
GLIDER SUPPORT ASSEMBLY

John Horn, London, Canada, assignor to Lear Siegler, Inc., Berkley, Mich.

Continuation-in-part of Ser. No. 660,709, Oct. 15, 1984, abandoned. This application Feb. 6, 1987, Ser. No. 13,209

Int. Cl.[4] A47G *29/00*

U.S. Cl. 248—370 **14 Claims**



1. A glider support assembly for a chair or other similar article of furniture, comprising: a lower floor base including a pair of laterally spaced supports that project upwardly; each support having downwardly facing front and rear base stop portions that respectively provide front and rear base stops; an upper frame including a pair of laterally spaced elongated members that extend horizontally so as to be attachable to the chair; the upper frame also including front and rear legs portions projecting downwardly from each elongated member in a vertically overlapping relationship with the upwardly projecting supports of the floor base on the outboard sides of the supports; a pair of laterally spaced front suspension links that respectively extend downwardly from the pair of supports of the floor base to the adjacent front leg portions of the upper frame and have pivotal connections thereto; a pair of laterally spaced rear suspension links that respectively extend downwardly from the pair of supports of the floor base to the adjacent rear leg portions of the upper frame and have pivotal connections thereto to cooperate with the front links in supporting the upper frame and chair attached thereto for forward and rearward gliding movement and for positioning in a reclined position; a front rod that extends between the pair of front suspension links and has opposite end portions providing front suspension link stop portions which provide front suspension link stops that are forced against the front base stops of the supports in the reclined position by the rearwardly inclined

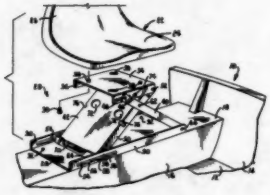
weight of the chair and its occupant to hold the chair in the reclined position; and a rear rod that extends between the pair of rear suspension links and has opposite end portions providing rear suspension link stop portions which provide rear suspension link stops that are forced against the rear base stops of the supports to limit forward tilting movement.

4,700,921

ADJUSTABLE PEDESTAL FOR BOAT SEATS

James H. Holbrook, 2410 S. Madison, Raymore, Mo. 64083

Filed Mar. 3, 1986, Ser. No. 835,625
Int. Cl.[4] F16M *13/00*; B63B *29/04*
U.S. Cl. 248—421 **5 Claims**



1. An adjustable pedestal for installation in a fishing boat to support a boat seat in the boat, said pedestal comprising:

a base adapted to be secured on a generally horizontal support surface in the boat;

a platform for receiving and supporting the boat seat, said platform having a generally planar surface on which the seat is carried and which faces away from the base;

a pair of substantially parallel pivot arms each having a lower end pivoted to said base and an upper end connected with said platform for linear movement thereon;

a rigid panel having an upper end pivoted to said platform at a location offset from the upper ends of said arms and a lower end connected with said base for linear movement thereon toward and away from the lower ends of said arms, said panel being pivoted to each of said arms at a location between the upper and lower ends thereof to mount the platform for movement between a raised position wherein the platform is elevated above the base and a lowered position wherein the platform is adjacent the base, said planar surface being maintained in a substantially horizontal orientation in the raised and lowered positions and in all positions therebetween and said platform being restricted to substantially vertical movement between the raised and lowered positions; and

releaseable means for rigidly locking said platform in the raised position.

4,700,922

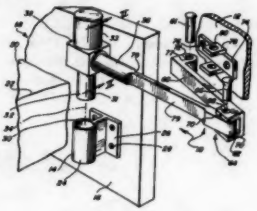
MEDICAL EQUIPMENT MOUNTING APPARATUS

James R. Gross, Bartlett, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 20, 1984, Ser. No. 684,238
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—558 **6 Claims**

1. Apparatus for mounting medical equipment to standard intravenous pole mounting holes of two different sized diameters, comprising:

a pivot coupler member having a pair of opposite ends of different diameters for snug receipt of one of said ends at a time within intravenous pole mounting holes of correspondingly different standard sized diameters, respectively, and



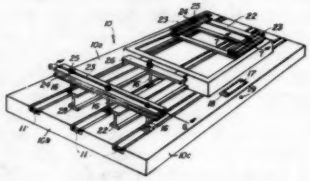
means for mounting the medical equipment to the coupler member intermediate the pair of opposite ends.

4,700,923

UNIVERSAL, PORTABLE, CONCRETE SLAB BASE FOR PUMP JACKS

Irvin H. Lewis, Jr., and Charles W. Lewis, both of 3980 S. 2500 East, Vernal, Utah 84078

Filed May 19, 1983, Ser. No. 496,121
Int. Cl.[4] F16M *1/00*
U.S. Cl. 248—679 **9 Claims**



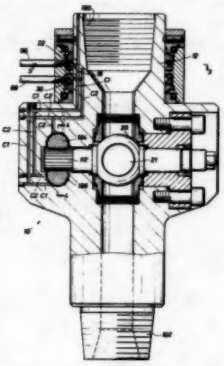
1. In combination, a universal, portable base comprising a substantially rectangular slab of reinforced concrete having three structural I-beams extending longitudinally from end-to-end thereof substantially equally spaced apart, with their upper flanges substantially flush with the upper surface of the slab and the lower portions of the webs embedded in the concrete, there being respective longitudinal smooth walled recesses, which recess walls are equidistant from one another extending from end-to-end of the slab and open at the ends within which the upper flanges and upper portions of the webs of the I-beams and the ends thereof are freely exposed as rails, said flange ends spaced essentially equidistant from said longitudinal recesses walls; anchor slide means for the reception and adjustable positioning along each said I-beam flange, in clearance with said longitudinal recess walls; means for providing said longitudinal recesses with smooth essentially equidistant walls; a pump jack mounted on said base; anchor slides at selected locations on one or more of said rails as required by the particular type of pump jack; structural tie-downs positioned for fastening the pump jack to said anchor slides; and externally threaded tie-down elements passed through said tie-downs and having their lower ends threaded into said anchor slides and nuts on their upper ends cinched down upon said tie downs.

4,700,924

PRESSURE ENERGIZED ROTARY HYDRAULIC SEAL

John E. Nelson, Houston, and Raymond J. Smith, Friendswood, both of Tex., assignors to Vetco Gray, Inc., Houston, Tex.

Filed Oct. 6, 1986, Ser. No. 915,565
Int. Cl.[4] F16K *31/124;* F15J *15/40*
U.S. Cl. 251—58 13 Claims



13. A remotely operably valve for controlling fluid flow through a rotating tubular member having

a remotely disposed and controllable source of pressurized hydraulic fluid,

a tubular housing having a flow passage formed therein and having an external diameter, said tubular housing adapted for rotation about its longitudinal axis,

first and second ports through an external surface of said housing, said ports having axial widths on a housing external surface, said ports respectively communicating with first and second conduits in the wall of said tubular housing,

a valve disposed in said flow passage of said tubular housing, said valve having an actuation shaft for rotating said ball valve to an open position and to a closed position for opening or closing said flow passage,

a first piston actuator means in fluid communication with said first conduit and coupled to said actuation shaft for rotating said shaft to said open position,

a second piston actuator means in fluid communication with said second conduit and coupled to said actuation shaft for rotating said shaft to said closed position,

first and second deformable seal members each having,

an outer surface,

two inner ring sealing surfaces axially separated from each other by a distance greater than said port axial width said inner ring sealing surfaces in the undeformable state of said deformable member having internal diameter slightly greater than said external diameter of said tubular housing,

an annular channel disposed between said two sealing surfaces, and

at least one hole between said outer surface and said annular channel,

a seal retainer non-rotatingly coaxially disposed about said exterior surface of said tubular housing, said seal retainer defining first and second retaining slots,

said first and second seal members disposed respectively within said first and second retaining slots with said two sealing surfaces of each of said seal members facing said exterior surface of said tubular housing while respectively each being axially disposed on opposite sides of said first and second ports,

first and second pressure inlet means for providing fluid communication from said source of pressurized hydraulic fluid respectively to said outer surface of said first and second seal members,

first and second primary sealing means disposed radially inwardly from said outer surface of said first and second seal members for sealing said seal member respectively within said first and second slots,

whereby application of pressurized fluid to said outer surface of said first seal member causes it to deform inwardly until its two inner ring sealing surfaces seal against said external surface of said tubular housing operably providing a sealed fluid communication path to said first piston actuator means operably actuating said ball valve to an open position, and

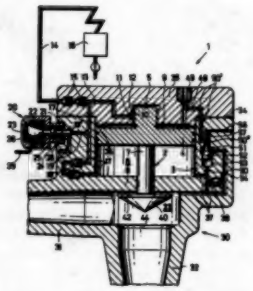
whereby application of pressurized fluid to said outer surface of said second seal member causes it to deform inwardly until its two inner ring sealing surfaces seal against said external surface of said tubular housing operably providing a sealed fluid communication path to said second piston actuator means operably actuating said ball valve to a closed position.

4,700,925

PRESSURE MEDIUM OPERATED SERVOMOTOR ARRANGEMENT

Steffen P. Russak, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 12, 1983, Ser. No. 560,238
Claims priority, application Switzerland, Dec. 15, 1982, 7288/82
Int. Cl.[4] F16K *31/124, 35/00*
U.S. Cl. 251—73 10 Claims



1. In combination,

a normally open valve having a valve chamber for receiving a pressurized flow of medium, an outlet for expelling the flow of medium from said chamber and a valve lid for closing said outlet; and

a servomotor arrangement for controlling movement of said valve lid, said arrangement including

a cylinder;

a piston movably mounted in said cylinder to divide said cylinder into two piston chambers and connected to said valve lid;

a duct communicating said valve chamber with one of said piston chambers to pressurize said one chamber;

a pressure chamber;

at least one latching member disposed across said pressure chamber for movement transversely of the direction of movement of said piston between a latching position and a release position, said latching member having a surface for frictionally engaging said piston to latch said piston in said latching position and to unlatch said piston in said release position;

first means connecting said pressure chamber to at least one pressure medium source for receiving a pressurized me-

dium to retain said latching member in said latching position;

second means for selectively connecting said pressure chamber to at least one pressure medium sink with said latching member in said release position; and

a stop member in at least one of said means to selectively block communication between said one means and said pressure chamber.

4,700,926

PIPE COUPLING

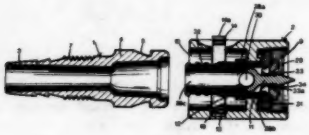
Albert F. Hansen, 8 Punga Grove Road, Whangarei, New Zealand

Filed Apr. 30, 1986, Ser. No. 858,460

Claims priority, application New Zealand, May 3, 1985, 211983; Dec. 23, 1985, 214706

Int. Cl.[4] F16L *37/28*

U.S. Cl. 251—149.8 **16 Claims**



1. A pipe coupling comprising:

a first coupling part connectable to a pipe or fitting and including a body portion,

a second coupling part connectable to a pipe or fitting and comprising a hollow interior adapted to receive the body portion of the first coupling part in sealing engagement,

an annular recess in said body portion of said first coupling part,

a transverse slot in said second coupling part across said hollow interior, said slot comprising a slot base wall across one end thereof and being open to the exterior of said second coupling part at the other end thereof, and

a release bar in said slot, said release bar comprising an aperture therethrough of a diameter similar to the diameter of the said first coupling part body portion, and comprising a portion protruding from said other end of said slot, said release bar being reciprocally movable within said slot across said hollow interior of said second coupling part towards and away from said slot base, between a first position wherein said aperture in said release bar is substantially aligned with said hollow interior such that said body portion of said first coupling apart can be entered into or removed from the said hollow interior and a second position wherein said aperture is offset from the said hollow interior such that an operative portion of said release bar adjacent the periphery of said aperture engages said annular recess of the said first coupling part when same is received in said hollow interior, to retain same therein, and said release bar being resiliently urged towards said second position and manually movable therefrom to said first position by pressure application to said protruding top portion of said release bar.

4,700,927

SLIDE GATE

Robert W. Henderson, New Salem, Mass., assignor to Rodney Hunt Company, Orange, Mass.

Filed Nov. 12, 1986, Ser. No. 929,920

Int. Cl.[4] F16K *3/14*

U.S. Cl. 251—158 **10 Claims**

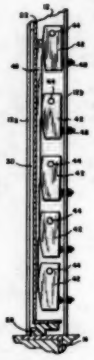
1. A slide gate comprising:

a frame including parallel channel guides extending vertically from and cooperating with a horizontal bottom to define a gate opening, said channel guides each having mutually spaced first and second guide flanges protruding laterially into said opening;

a gate disc supported by said frame for vertical movement between a lowered position resting on said bottom and an open position spaced vertically therefrom, said gate disc having side portions received between the first and second guide flanges of said channel guides;

seal assemblies interposed between said disc side portions and the respective first flanges of said channel guides;

a plurality of vertically spaced pivotal pressure pads mounted on each of said channel guides, said pressure



pads being arranged between each of said disc side portions and a respective one of said second guide flanges; and

adjustment means for pivotally adjusting said pressure pads to bear against said disc side portions when the gate disc is in the lowered position, thereby urging said gate disc towards said first flanges to compress said seal assemblies between said disc side portions and said first flanges, said adjustment means comprising adjustment screws extending through said second guide flanges and bearing against said pressure pads at first contact points spaced radially from the pivotal axes of said pressure pads.

4,700,928

VALVE ASSEMBLY

Garry R. Marty, Noblesville, Ind., assignor to Masco Corporation of Indiana, Indianapolis, Ind.

Filed Oct. 31, 1986, Ser. No. 925,994

Int. Cl.[4] F16K *5/10*

U.S. Cl. 251—310 **20 Claims**

1. A faucet valve assembly comprising:

a valve body having a first bore, a second bore smaller than and opening into said first bore, said second bore offset from the longitudinal axis of said first bore, and an outlet port in said valve body open to said first bore;

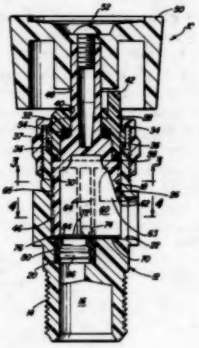
a valving member rotatable in said first bore of said valve body, said valving member including a plurality of axially extending ribs circumferentially spaced on the outer periphery of said valving member and having a flow chamber defined by a partial axial bore open to the bottom end of said valving member;

a metal flow plate secured to said valving member, said flow plate enclosing the bottom end of said valve member to form said flow chamber and an outlet passageway capable of registry with said outlet port of said valve body, said flow plate having an inlet aperture offset from the axis of rotation of said valving member; and

a substantially tubular valve seal seated in said second bore of said valve body, said valve seal having an annular

valving surface cooperating with said flow plate to control the flow of water into said flow chamber and an inlet passage therethrough;

wherein upon rotation of said valving member said inlet



aperture of said flow plate is brought into registry with said inlet passage of said valve seal, said outlet passageway of said valving member being in registry with said outlet port of said valve body in at least some of the rotational positions of said valving member.

4,700,929

MOUNTING A METALLURGICAL VESSEL

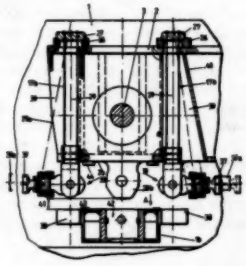
Karlheinz Langlitz, Muelheim, and Guenter Schnitz, Duisburg, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,407

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 3410949

Int. Cl.[4] C21C *5/42*

U.S. Cl. 266—246 **5 Claims**



1. The mounting of a metallurgical vessel in a full or partial ring being in turn tiltably mounted by means of pins pivotably held in stationary bearings, comprising:

a plurality of tension means articulated to the upper side of the ring and transversing the ring generally in a direcition parallel to the axes of the vessel;

a plurality of claw elements affixed to the vessel and each having a lateral opening, the lower portion of the respective tension means being situated and held in the opening after having been laterally inserted due to said tension means being articulated; and

tension head means being part of the respective tension means for lodging behind the respective claw elements to thereby hold said tension means when inserted there being tension nut means for releasably tightening the respective tension head to the respective claw element.

4,700,930

DEVICE FOR INJECTING PULVERULENT MATERIAL, SUCH AS COAL, IN A BLAST FURNACE

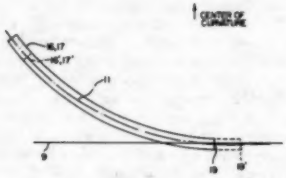
Yann de Lassat de Pressigny, Metz, and Michel Schneider, Semecourt, both of France, assignors to Institut de Recherches de la Sidergie Francaise Irsid, Maizieres-Les-Metz, France

Filed Apr. 14, 1986, Ser. No. 851,204

Claims priority, application France, Apr. 15, 1985, 85 05635

Int. Cl.[4] C21B *7/16*

U.S. Cl. 266—267 **11 Claims**



1. A device for injecting pulverulent material into a blast furnace, comprising:

a hot blast tuyere having a straight axis and issuing into the blast furnace,

a nozzle fixed against said tuyere, having the same axis as said tuyere and for bringing the hot blast,

a branch connection produced obliquely on the nozzle and directed towards the tuyere, and

an injection pipe having a central axis traversing said branch connection and having an outlet orifice issuing into said tuyere, the central axis of said injection pipe being substantially an arc of a circle with a convexity directed towards the axis of the nozzle and of the tuyere, said injection pipe pivoting about the center of curvature of the central axis and the axial location of the outlet orifice varying through a range of axial positions while keeping close to the axis of the nozzle and the tuyere.

4,700,931

RESILIENT MOUNTING

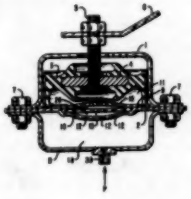
Günter Eberhard, Gehrden, and Jürgen Heitzig, Hanover, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 733,211, May 10, 1985, abandoned. This application Jan. 8, 1987, Ser. No. 4,790

Claims priority, application Fed. Rep. of Germany, May 15, 1984, 3417927

Int. Cl.[4] F16F *13/00*

U.S. Cl. 267—35 **1 Claim**



1. A resilient mounting as a spring- and damping-medium

containing air rather than hydraulic fluid and having a genuine rubber/air spring element arrangement as a unique spring-damper system that receives a load and having an air cushion formed by a rigid housing having an upper opening as well as a lower opening and a diaphragm-like resilient shock absorber which closes off the upper opening of said housing; said shock absorber, via a thrust plate connected thereto, directly receives the load of said mounting, and said housing, via through-holes in a rigid base plate which closes off the lower opening of said housing, is in constant communication with a supplemental space which is located on that side of said base plate remote from said shock absorber, and which receives compressed air, the pressure of which can be regulated and varied via compressibility of air; the improvement in combination therewith which comprises: a flexible diaphragm which spans said through-holes in said base plate, and which is provided with a throttled transfer hole that throttles flow of transferred air as the spring- and damping-medium and having a cross-sectional area which is less than that of said through-holes; said mounting being provided with limit stop surfaces between which said flexible diaphragm is deformable in both directions, namely toward and away from said shock absorber, in response to pressure differences between said supplemental space and the interior of said housing between said shock absorber and said base plate so that possibility exists to have varied compressibility of air accompanied by variable spring-characteristic of the rubber/air spring element whereby spring characteristics thereof overlap each other and also within the rubber/air spring arrangement to attain an aimed and variable damping of spring movements in that air is employed both as practical inertia-less flow medium as the spring- and damping-medium for damping high and low frequency vibrations and oscillations and air also is employed as an additionally elastic-compressible spring; to provide the air cushion with an effective acoustic uncoupling without adversely affecting spring or shock absorption characteristic; a first one of said limit stop surfaces being formed by said base plate, and a second one of said limit stop surfaces being formed by a rigid counter-plate which is fixedly attached at a distance from said through-holes of said base plate; said counter-plate also being provided with through-holes, and having a periphery which cooperates sealingly with either said base plate or said housing; said flexible diaphragm having a periphery which is sealingly secured between said base plate and said counter-plate; said base plate and said counter-plate each being arched away from said flexible diaphragm in a dome-like fashion; said base plate and said counter-plate defining and enclosing a space which is centrally and symmetrically spanned by said flexible diaphragm in the nondeformed state of the latter; by means of said through-holes of said base plate and of said counter-plate, said last-mentioned space always being in communication with the interior of said housing and with said supplemental space; said counter-plate being disposed between said flexible diaphragm and said shock absorber, and being arched toward the latter, and said base plate being disposed on that side of said flexible diaphragm remote from said shock absorber so that pressure equalization is initially induced by deformation of said flexible diaphragm and only after the latter rests against one of said plates is transfer of air effected through said throttled transfer hole in this manner making possible the damping of spring and shock-absorber oscillations effective from a specified oscillation amplitude limit as a function of structurally prescribed freedom of movement of said diaphragm.

4,700,932

ANTI-IMPACT SAFETY APPARATUS FOR ROBOT

Hiroshi Katsuno, Nagoya, Japan, assignor to Tokai Sogo Sekkei Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 7, 1986, Ser. No. 827,353

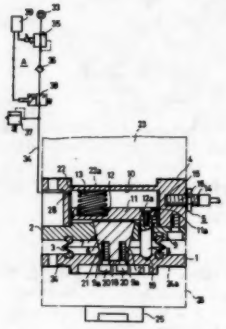
Claims priority, application Japan, Feb. 21, 1985, 60-24433[U]

Int. Cl.[4] F16M *1/00*; B61G *11/12*; B25J *19/00*; E02D *27/34*

U.S. Cl. 267—136 **24 Claims**

10. An anti-impact safety apparatus for absorbing an impact load and outputting a detection signal when the impact load exceeds a predetermined load, said apparatus adapted for connection between two members, one of which receives the impact load and the other of which receives the detection signal from said apparatus when the load exceeds a reference value, comprising:

a buffer mechanism adapted for connection between the two members to absorb an impact load on one of the members, said buffer mechanism including a movable plate adapted for connection to a first member which receives an impact load, said movable plate having a conical guide mounted on a planar side thereof, said buffer mechanism including a fixed plate adapted for connection to a second member having a function unit associated therewith and which is operated electrically, said fixed plate having a planar side thereof facing said planar side of said movable plate, said fixed plate having a conical guide hole extending therethrough at a central portion of said planar side thereof, said guide hole receiving said guide and having a configuration conformable to said guide whereby said guide is omnidirectionally tiltable in said guide hole, said fixed plate having a plurality of pin receiving bores extending through said planar side thereof at positions surrounding said guide hole, said buffer mechanism further including piston means for absorbing an impact load transmitted from the first member to said movable plate, said piston means including a piston biased towards said fixed plate by pressurized fluid and movable towards and away from a planar side of said fixed plate facing away from said movable plate, said piston supporting a plurality of pins each of which extends through a respective one of said pin receiving bores in said fixed plate and said buffer mechanism including a sensor switch means for detecting the impact load transmitted from the first member to said movable plate and providing a detection signal to stop operation of the function unit associated with the second member when the impact load exceeds a reference value.



4,700,933

SHOCK ABSORBING APPARATUS FOR AN ENGINE

Sunao Chikamori, Nagoya, and Hideyuki Iwata, Okazaki, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 587,523, Mar. 8, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 881,564

Claims priority, application Japan, Mar. 15, 1983, 58-36222

Int. Cl.[4] F16F *9/34, 13/00*

U.S. Cl. 267—140.1 **7 Claims**

1. An engine shock absorbing apparatus comprising:

a casing containing a liquid;

a partitioning member having an opening therein along its length fastened to said casing and to one of either an engine or an automotive body, thus dividing the inside of

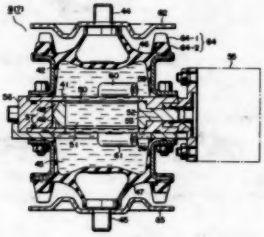
said casing into two chambers; said opening extending along a majority of said partitioning member length;

elastic walls provided on a wall section of both chambers for varying the capacity of said chambers by elastic deformation of said elastic wall;

a mounting member which is fixed to the other side of an engine or an automotive body and so supported on the elastic wall of one of said both liquid chambers as to be changed in position relative to said partitioning member;

an elastic stopper which is fitted to one side of either said mounting member or partitioning member outside of said liquid chambers, and is so designed as to contact the other side of said mounting member or partitioning member when said elastic wall is displaced beyond a predetermined extent;

a variable orifice device which is inserted into said partitioning member so as to rotate around the axis of said partitioning member separating said both liquid chambers from each other, is provided with a communication passage for effecting the communication between both liquid chambers, and is designed to vary the manner in which both liquid chambers communicate with each other in accordance with the angle of rotation of said orifice device; said communication passage having an oblate cross section whose axis is parallel to the axis of said variable orifice device and whose length is coextensive with said opening whereby free communication is allowed between said chambers when said communication passage and said opening are aligned;



rotary drive means which is set outside of said casing, and controls the angle at which said rotary valve is turned, thereby adjusting the opened extent of said variable orifice device;

roll-detecting means for detecting the rolling tendency of the engine; and

a control circuit which is electrically connected to said rotary drive means and roll detecting means and sends forth a control signal to said rotary drive means in accordance with the contents of a signal delivered from said roll-detecting means.

4,700,934

PRETENSIONABLE AND HYDRAULICALLY DAMPED MOUNTING ELEMENT

Rainer Andrä, Limburg, and Manfred Hofman, Hünfelden, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

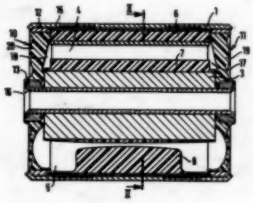
Filed Apr. 21, 1986, Ser. No. 854,124

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1985, 3514268

Int. Cl.[4] F16M *15/04, 13/00;* **F16F** *7/00*

U.S. Cl. 267—140.1 **4 Claims**

1. Pretensionable and hydraulically damped mounting element with an outer metallic mounting sleeve, and an inner metallic bushing which are mutually connected by opposite, substantially radially extending elastomeric bridges vulcanized thereto, the elastomeric bridges at least partly defining respective chambers located at opposite sides of the inner bushing and serving as a mechanical spring, the chambers being filled with hydraulic fluid, comprising separate end caps located at respective end faces of the mounting element and closing off the chambers, said end caps being formed of elastic, deformable elastomeric material, said separate end caps having different cross sections varying over the circumferences thereof, both in circumferential direction as well as in radial direction, and defining with respective end faces of the elastomeric bridges overflow channels connecting the chambers and having a cross section varying in accordance with respective strokes imparted to the mounting element.



4,700,935

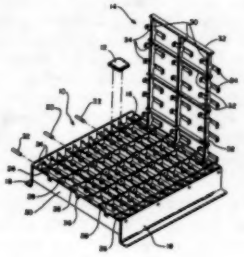
FIXTURE FOR WAVE SOLDERING PACKAGED INTEGRATED CIRCUITS

Russell T. Winslow, 4075 Laguna Way, Palo Alto, Calif. 94306, and Thomas M. Golda, 460 Dempsey Rd., #263, Milpitas, Calif. 95035

Filed Feb. 7, 1986, Ser. No. 827,835

Int. Cl.[4] B23Q *3/00*

U.S. Cl. 269—126 **5 Claims**



1. A fixture for supporting packages during wave soldering of leads on the packages comprising

a carrier portion including two sets of orthogonal support members, said orthogonal support members having formed edges defining seats for receiving the packages, and

a frame cover pivotally attached to said carrier portion for retaining packages in said seats when said fixture is turned upside down, said frame cover including appendages extending therefrom for engaging packages,

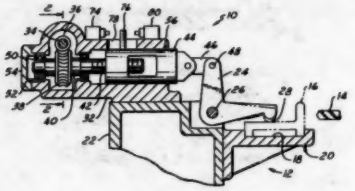
said support members having notches in said edges for receiving said frame cover.

4,700,936

CLAMP MECHANISM

Garfield R. Lunn, Amherstburg, Canada, assignor to Lamb Technicon Corp., Warren, Mich.

Filed Aug. 26, 1986, Ser. No. 900,437
Int. Cl.[4] B25B *1/06*
U.S. Cl. 269—226 7 Claims



1. A device for clamping a workpiece comprising, a housing, a jack shaft carried by said housing, a nut received on a threaded portion of said jack shaft and having threads mating therewith, a worm gear connected to one of said jack shaft and nut for rotating it relative to the other of said jack shaft and nut, bearing means carried by said housing and mounting said one of said jack shaft and nut for rotation and without any substantial axial movement relative to said housing, a clamp member operably connected to the other said jack shaft and nut and constructed and arranged to move in response to rotation of said worm gear in one direction to a clamped position wherein it bears on the workpiece and to move in response to rotation of said worm gear in the opposite direction to an unclamped position wherein it is disengaged and spaced from the workpiece, a drive shaft carried by said housing for rotation on and movement along an axis extending generally transverse to the axis of rotation of said worm gear, a worm connected to said drive shaft and meshing with said worm gear, a reversible electric motor having an output shaft, a coupling connecting said output shaft with said drive shaft for rotation therewith and construed and arranged to permit said drive shaft to move axially relative to said housing, and a spring carried by said housing, operably connected with said drive shaft and constructed and arranged to bias through said drive shaft, worm, worm gear, jack shaft and nut said clamp member into engagement with the workpiece at least when the drive shaft is rotated by said motor in the same direction sufficiently to axially displace the drive shaft after the worm gear has been rotated sufficiently to advance the clamp member to its clamping position, whereby the clamp member is biased into engagement with the workpiece.

4,700,937

FRONT GAUGE FOR MACHINE TOOL

Nelson A. Naylor, 3941 Rocky View Dr., Norco, Calif. 91760

Filed Apr. 1, 1986, Ser. No. 846,926
Int. Cl.[4] B26D *7/01*
U.S. Cl. 269—304 6 Claims

1. A front position locating gauge for a machine tool comprising:

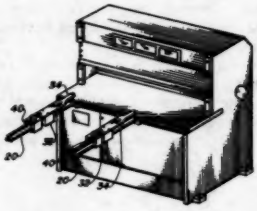
(a) a support arm having a plurality of equally spaced holes therewithin, removably joined to the front of the machine tool providing an extended mounting surface;

(b) a front head having means to slide on said arm and an indexing member extending therefrom, the head slideably engaging the arm providing a stop on the end of he indexing member a linear alignment with the arm; said front head further having a dial indicator arm fastened to the top of the head providing a uniform measurable surface for engaging the indicating means;

(c) a rear head having means to slide on said arm, adaptably communicable with the front head for sliding on the arm in concert therewith;

(d) positioning means integral with said rear head decisively engaging a selected hole in the arm providing a predetermined location of the heads relative to the tool processing member;

(e) adjusting means joining the front and rear heads in a manual yielding manner within a fixed increment of measure allowing a precise distance from one head to the other to be generated; and,



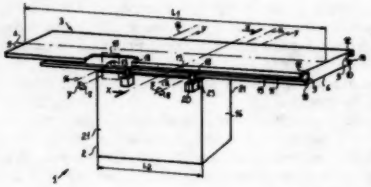
(f) indicating means integral with the rear head and contiguously engaging the front head for reading the linear distance therebetween, the gauge providing an adjustably precise distance between the end of the indexing arm and the machine tool by positioning the rear head using the nearest hole in the arm for the approximate location and making the final locational adjustment by sliding the front head to the exact position as verified by the indicating means.

4,700,938

EXAMINATION TABLE PROVIDING LINEAR GUIDANCE FOR AN EXAMINATION PANEL

Edmond Chambron, Gonesse, France, assignor to Thomson-CGR, Paris, France

Filed Mar. 19, 1986, Ser. No. 841,231
Claims priority, application France, Mar. 22, 1985, 85 04336
Int. Cl.[4] A61G *13/00*
U.S. Cl. 269—322 14 Claims



1. An examination table for linear guidance of an examination panel, comprising a frame with respect to which said examination panel is displaced along a longitudinal axis, bearing rollers attached to said frame for supporting a bottom face of said examination panel, first and second rolling means for guiding said examination panel, said panel comprising an internal portion formed of a first material and enclosed within an external portion which constitutes a casing and is formed of a second material, said external portion being intended to define a bottom face, a top face and logitudinal side elements of said examination panel, said side elements being constituted by a longitudinal member which serves to guide said examination panel, wherein the external portion aforesaid comprises at least one projecting portion which extends beyond each longitudinal side element aforesaid and in which said longitudinal member is formed, said projecting portion being formed in one

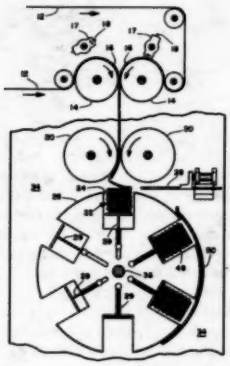
piece with said external portion in order to be made of the same first material and to retain along said longitudinal side elements a similar absoprtion capacity for ionizing radiation as said examination panel.

4,700,939

APPARATUS AND PROCESS FOR SEPARATING AND REMOVING BUNDLES OF SHEETS

John M. Hathaway, Green Bay, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 12, 1986, Ser. No. 895,780
Int. Cl.[4] B41L *1/32*
U.S. Cl. 270—39 **31 Claims**



1. Apparatus for receiving sheets, and separating and removing of bundles of stacked sheets from the discharge area of sheet stacking apparatus, said separating and removing apparatus comprising:

(a) a frame;

(b) rotatable receiving means mounted on said frame and having a plurality of sheet receiving chambers;

(c) means, adjacent said rotatable receiving means, for separating one said bundle from sheets being received; and

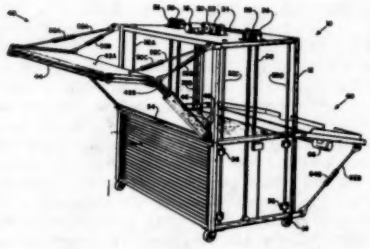
(d) means for rotating said rotatable receiving means.

4,700,940

BLUEPRINT COPY COLLATING APPARATUS

Theodas C. King, Rte. 3, Box 343, Pittsboro, N.C. 27312

Filed Jul. 1, 1986, Ser. No. 880,715
Int. Cl.[4] B65H *39/05, 39/11*
U.S. Cl. 270—58 **17 Claims**



1. A blueprint copy collating apparatus for use with a blueprint copying machine and comprising:

a frame;

a bin array comprising a plurality of vertically spaced-apart blueprint receiving bins each having a blueprint receiving side and a blueprint removal side, said bin array adapted for being vertically movable relative to said frame;

conveyor means secured to said frame for transporting blueprint copies from a blueprint machine to the blueprint receiving side of said bin array;

drive means for vertically raising and lowering said bin array relative to said conveyor means according to a predetermined sequence in order that said blueprint receiving bins may receive blueprint copies from said conveyor means according to the predetermined sequence;

control means electrically connected to said drive means for controlling the sequence in which blueprint copies are received in said bins according to a predetermined selection by a user of said collating apparatus; and

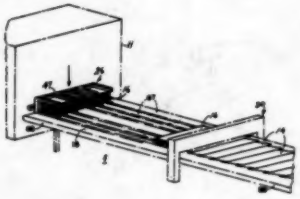
vibrator table means secured to said frame for vibrating a plurality of blueprint copies removed from said bin array in order to align the blueprint copies.

4,700,941

CORRUGATED SHEET UNSTACKING AND FEEDING APPARATUS

David Shill, Newman Lake, Wash., assignor to Thermoguard Equipment Inc., Spokane, Wash.

Filed May 22, 1986, Ser. No. 866,162
Int. Cl.[4] B65H *1/22*
U.S. Cl. 271—151 **6 Claims**



1. A corrugated sheet unstacking and feeding apparatus for removing sheets from a vertical stack of sheets and feeding the sheets in a shingled fashion along a feed axis with each sheet being laterally centered with respect to the feed axis; comprising:

a powered elongated feed conveyor extending along a feed axis and having a receiving end and a discharge end;

elevator means for receiving a vertical stack of corrugated sheets and moving the stack upward until the top of the stack reaches a desired elevation above that of the feed conveyor;

block handling means adjacent the receiving end of the feed conveyor for (1) removing a block of sheets from the elevated stack, (2) inverting the block of sheets, (3) aligning lateral edges of the sheets within the block as the block is being inverted, (4) laterally centering the block of sheets with the feed axis, and (5) depositing the centered block of sheets on the receiving end of the feed conveyor laterally centered with the feed axis;

the block handling means comprising:

a block inverting carriage movable with respect to the elevated stack of sheets and the elongated feed conveyor, the block inverting carriage being both vertically movable from an elevated position adjacent the top of the elevated stack to a lowered position adjacent the receivng end of the feed conveyor, and being movable from a first pivot position for receiving an uppermost block of sheets from the elevated stack through a second pivot position in which the block of sheets is vertically oriented, and to a third pivot position in

which the block of sheets is inverted from its original orientation in the elevated stack;

the block inverting carriage including laterally opposed alignment elements mounted to the carriage for movement in unison with it;

drive means operably connected between the carriage and alignment elements for moving the alignment elements laterally inward with respect to the moving carriage and the feed axis for (1) aligning the edges of the sheets within the block with each other and (2) shifting the block of sheets laterally with respect to the moving carriage to center the block relative to the feed axis; and

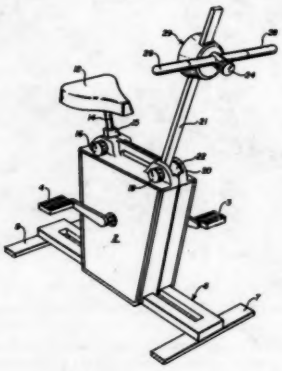
shingling means along the feed axis between the receiving end and the discharge end of the feed conveyor for engaging the moving inverted laterally aligned block and feeding the sheets to the discharge end in a sequential shingled fashion.

4,700,942

EXERCISE APPARATUS WITH LOCKING MEANS

James E. Danchulis, 244 Sunset Dr., Pittsburgh, Pa. 15235

Filed May 20, 1985, Ser. No. 736,142
Int. Cl.[4] A63B *23/04;* B62K *21/22*
U.S. Cl. 272—73 **3 Claims**



1. Exercise apparatus comprising

a body support portion,

a manually engageable portion,

locking means operatively associated with and securing one or both said portions in a desired position,

a tubular means operatively associated with said locking means having an opening for receipt of a portion of said locking means,

an adjustable member operatively associated with at least one said portion and extending through a part of said locking means within said tubular means,

said locking means having clamping means and knob means for positioning said clamping means,

said clamping means having a closed configuration defining a passageway for receipt of said adjustable member,

said clamping means being mounted for reciprocation in a direction generally transverse to the axial extent of said adjustable member,

said tubular means having at least one recess for receipt of said clamping means, and

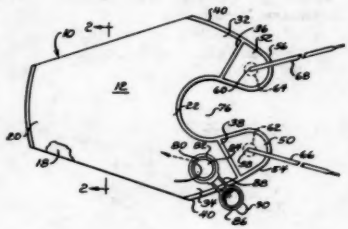
said locking means adapted to be in compression with said adjustable member when said clamping means is disposed in said recess of said tubular means.

4,700,943

EXERCISING DEVICE

Paul R. Widinski, Arvada, and Glenn N. Taylor, Longmont, both of Colo., assignors to Health and Home Products, Longmont, Colo.

Filed May 10, 1985, Ser. No. 732,832
Int. Cl.[4] A63B *23/04, 21/12*
U.S. Cl. 272—96 **10 Claims**



1. An exercising device for the foot or hand, comprising;

an instep portion adapted to cover the upper portion of the foot comprising a pair of flexible sheets defining a closed chamber to receive a weight medium, said instep portion adapted to extend from a location adjacent the toes to a location adjacent the ankle, and having a pair of opposed side portions adapted to extend around opposed sides of the foot and defining a pair of opposed side edges, one extremity of said instep portion having a curved configuration thereby defining a pair of opposed ends, each being in fluid communication with said chamber and adapted to extend toward the ankle on opposed sides of the foot;

closable access means associated with the instep portion to place the weight medium in said member;

a sole strap extending between the opposed sides of the instep portion adapted to be placed beneath the foot, said instep portion and sole strap defining a first opening adapted to receive the toes, and a second opening adpated to receive the heel;

a pair of opposed ears extending from the opposed ends of the instep portion, not in fluid flow communication with the opposed ends and adapted to extend toward the ankle; and

means for securing the ears together adapted to secure the ears about the ankle.

4,700,944

MULTI-FUNCTION WEIGHT LIFTING EXERCISE SYSTEM

Richard F. Sterba, 9536 Bauer Ave., Baltimore, Md. 21236, and James R. Slade, Jr., 45 Cedar Hill Rd., Randallstown, Md. 21133

Filed Aug. 22, 1985, Ser. No. 768,416
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—117 **56 Claims**

1. In a system for weight lifting exercising having first and second vertical tracks, a bar carriage, a bar mounted on the bar carriage, the bar carriage having engagement with the first and second vertical tracks in position for being lifted by the bar, a weight carriage having engagement with the first and second vertical tracks on a side opposite said bar, the weight carriage having an upward weight post for carrying weights, a line attached for lifting the weight carriage at the upward weight post, the improvement comprising in combination: means including a first pulley at a location above the weight carriage for raising the weight carriage by the line, from a down position to an up position, when the bar is lifted, and the distance from the first pulley location to the first and second vertical tracks being less than the distance from the upward weight

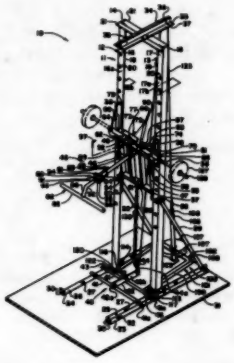
post to the first and second vertical tracks thereby biasing the weight carriage against the first and second vertical tracks.

36. In a system for weight lifting exercising having a vertical track and first carriage and second carriage with respective means for guiding the first and second carriages on the vertical track, when moved up or down, the improvement comprising:

the means for guiding the first carriage being set at an incline to the vertical track, the means for guiding the first carriage including means for detachably affixing the first carriage to the vertical track, and

means including a line and pulley mechanism for causing the second carriage to move up or down with the first carriage when the first carriage is moved up or down.

40. In a system for weight lifting exercising having a vertical



track and a weight carriage with an upward weight post for carrying weights, a first pulley having a mounting above the weight carriage and a line connecting the weight carriage and first pulley for moving the weight carriage up and down the vertical track, the improvement comprising in combination: means for maintaining the weight carriage at an angle for biasing the weight carriage against the vertical track when moving up and down the vertical track, said means including the distance from the first pulley mounting to the vertical track being different from the distance from the upward weight post to the vertical track, said line connecting the weight carriage and first pulley through said upward weight post, and the weight carriage having pivotal engagement with the vertical track for maintaining said upward weight post in alignment with said first pulley while moving up and down.

4,700,945

EXERCISE APPARATUS

Delbert L. Rader, Gresham, Oreg.

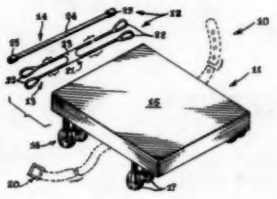
Filed Sep. 24, 1985, Ser. No. 779,344
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—127 **3 Claims**

1. A combined exercise apparatus equally adapted for use in both the horizontal and vertical planes wherein the combined apparatus consists of:

a wheeled platform unit comprising an elongated generally rectangular padded platform member provided with a plurality of downwardly depending wheeled elements proximate the corners of said platform member, wherein the wheeled elements are aligned for rolling contact with a surface in a direction perpendicular to the long dimension of the elongated generally rectangular padded platform member, and further including means for releasably securing the wheeled platform member to a users torso;

a rigid element comprising an elongated bar member having enlarged cylindrical caps formed on the opposite ends of said bar member; and,

an elongated strap comprising an elongated bifurcated double handled strap member wherein each end of the strap member is provided with a pair of handle loops, and the



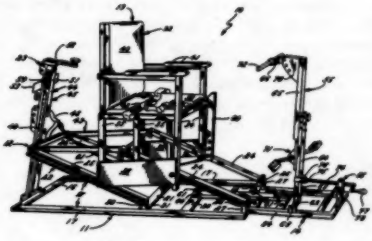
mid-section of the strap member is provided with an intermediate connecting portion, one pair of said handle loops being connectable to one of either said platform or said rigid element; whereby, the use while supported by the wheeled platform member may grasp a pair of handle loops and exert force against said rigid element.

4,700,946

EXERCISE DEVICE

Donald E. Breunig, 108 E. Arnold Rd., Sandwich, Ill. 60548

Filed Oct. 11, 1985, Ser. No. 786,473
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **20 Claims**



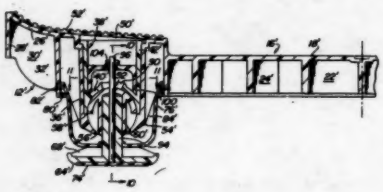
1. An exercise device which allows a user to exercise against a resistance proportional to his own weight, said exercise device comprising a base, a track mechanism pivotally mounted to the base, means for supporting the user, said supporting means being mounted to the tack mechanism for linear displacement along the track mechanism at a generally constant orientation with respect to the base, means interconnected between the track mechanism and the base for varying the angle between the track mechanism and the base without varying the orientation of the supporting means with respect to the base, whereby the user may vary the inclination of the track mechanism and move along the track mechanism while maintaining a generally constant orientation with respect to the base, and post means attached to the base for mounting at least one exercising apparatus, the post means including a mounting post and means for adjusting the distance between the mounting post and the track mechanism.

4,700,947

AMUSEMENT AND/OR EXERCISING DEVICE

Richard L. Heatwole, Rte. 2, Box 309, Corydon, Ind. 47112

Continuation-in-part of Ser. No. 426,350, Sep. 29, 1982, Pat. No. 4,530,498. This application May 2, 1985, Ser. No. 729,587
The portion of the term of this patent subsequent to Jul. 23, 2002, has been disclaimed.
Int. Cl.[4] A63B 23/04
U.S. Cl. 272—146 8 Claims



1. An amusement and/or exercising device comprising first and second pads spaced from each other, each pad being adapted to support one leg of a person, connecting means integral with the pads and having a ribbed cross section which resists twisting and which rigidly interconnects said pads, a discrete ground engaging element below and associated with each pad, each pad having movable foot receiving means movable between a first position proximate said connecting means and a second position away from said connecting means, each pad further having a hollow means defining at its lower end a bearing socket approximately ¾ of a sphere, each hollow means including a first concentric wall extending upwardly from its associated socket and being supported by a shoulder on a second concentric wall of its associated pad, said socket being partially defined by the lower end of said second concentric wall, a generally spherical bearing in each socket, connecting means connecting each bearing in a rigid manner to one of said ground engaging elements, each pad being pivotable relative to its associated bearing through a limited arc to thereby facilitate tilting the pads as a unit with one pad being higher than the other and off the ground, and rotation limiting means for permitting each to rotate through a limited arc relative to its associated ground engaging element in a lengthwise direction of said device while limiting rotation of the pads relative to their associated ground engaging elements in a transverse direction of said device.

4,700,948

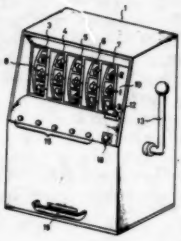
SLOT MACHINE WITH PLAYING CARD SYMBOLS

Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Nov. 4, 1985, Ser. No. 794,407
Claims priority, application Japan, Nov. 2, 1984, 59-165687[U]
Int. Cl.[4] A63F 5/04
U.S. Cl. 273—143 R 10 Claims

1. A slot machine adapted to provide combinations of symbols on prize-winning lines in a window, said slot machine comprising:

means for displaying five lengthwise individually movable series of symbols in which at least 52 different playing cards of a deck are distributed, said five series of symbols being started to move and then stopped to provide combinations of five symbols on said prize-winning lines; and



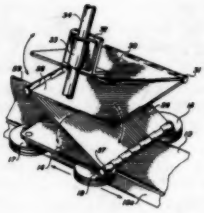
position control means for stopping said five series of symbols so as to prevent the same symbols of cards from appearing simultaneously in said window.

4,700,949

GOLF PUTTING TRAINER

Robert G. Nottoli, 4321 E. Stanford Dr., Phoenix, Ariz. 85018

Filed Jan. 27, 1987, Ser. No. 6,797
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—192 1 Claim



1. A golf putting training aid comprising:

a. a guide rail

b. a trolley which comprises four vee-grooved wheels attached to a trolley hinge plate cinched on said guide rail, allowing for only back and forth lateral movement on said guide rail

c. three additional hinge plates of similar size fastened to said trolley hinge plate with hinge pins

i. the first of said additional hinge plates being attached to said trolley hinge plate by a hinge pin at the right lateral side

ii. the second of said additional hinge plates being attached by a hinge pin to said first additional plate at the left lateral side

iii. the third of said additional hinge plates being attached by a hinge pin to said second additional plate at the back edge of said second additional plate, allowing said third plate to raise relative the other plates, and

d. a club support and clamp for holding a golf putter shaft firmly fastened to said third additional hinge plate at the front edge thereof midway between the ends of the hinge plates, allowing for stroking the club back and forth laterally.

4,700,950

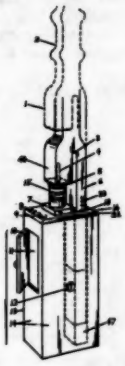
PROCESS FOR CRUSHING CANS

Ralph F. Gardner, 2115 Perth St., Toledo, Ohio 43607

Continuation-in-part of Ser. No. 600,104, Apr. 13, 1984, Pat. No. 4,597,327. This application Dec. 26, 1985, Ser. No. 813,483

Int. Cl.[4] A61B *5/22*; A63F *9/00*

U.S. Cl. 273—1 GH 2 Claims



1. A process for compressing cans in a competitive process comprising the steps of:

(a) raising a vertically reciprocal ram above a vertically positioned can;

(b) lowering said reciprocal ram in a vertically downwardly manually propelled force to have a portion of the ram impact against the top of the vertically positioned can so as to compress said can;

(c) measuring the resultant compressed height of the can.

4,700,951

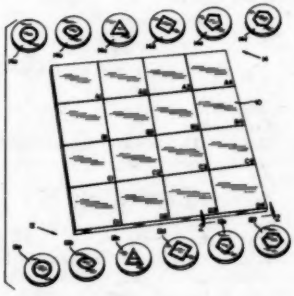
METHOD AND APPARATUS FOR PLAYING A GAME

Timothy T. Lachenmeier, 101 SW. Western Blvd., P.O. Box "O", Corvallis, Oreg. 97339, and Christian S. Howard, 147 SE. Richland St., Corvallis, Oreg. 97333

Filed Jul. 1, 1985, Ser. No. 750,905

Int. Cl.[4] A63F *3/02, 3/00*

U.S. Cl. 273—264 6 Claims



1. A method of playing a game comprising:

(a) providing a playing field having a plurality of zones;

(b) providing at least two groups of playing markers, one group for each player, each marker of each group being distinguishable from the other markers in said group wherein each marker of each group comprises memory indicia thereon to mnemonically signify a continuous, sequential and unchanging order in which each of said markers of said group are moved during the playing of said game;

(c) selecting the order in which said players will commence play;

(d) each player on his first turn placing a mnemonically signifying first marker on an electively selected unoccupied zone on said playing field, said placing of said markers continuing thereafter wherein during each of the player's next successive turns, each player similarly places a next mnemonically signifying marker on said playing field according to said continuous, sequential order of (b); and

(e) moving said markers after all of said markers are placed on the playing field, wherein during the next turn of each player, each player moves his mnemonically signifying first marker on said field to an unoccupied zone thereon, said moving of said markers continuing thereafter wherein during each of the players' next successive turns, each player similarly moves a next mnemonically signifying marker according to said continuous, sequential order of (b) with the objective of one of said players forming a continuous line of zones occupied by said markers of said player's group.

4,700,952

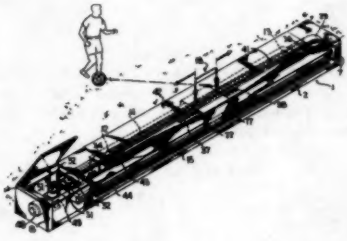
PROGRAMMABLE MOVING TARGET SOCCER PRACTICE

Samuel M. Patsy, P.O. Box 835, Rockville, Md. 20853

Division of Ser. No. 682,985, Dec. 18, 1984, Pat. No. 4,645,210, which is a continuation-in-part of Ser. No. 467,679, May 17, 1983, abandoned, which is a continuation of Ser. No. 118,828, Feb. 5, 1980, abandoned. This application Nov. 14, 1986, Ser. No. 910,475

Int. Cl.[4] F41J *9/02*

U.S. Cl. 273—369 8 Claims



1. An apparatus for practicing motor skills comprising:

a target,

means for supporting the target for movement along a predetermined path,

means for selectively moving said target at various speeds and in opposite directions along said predetermined path,

a trench,

said means for supporting being disposed in said trench,

means for protecting including a cover over said means for supporting,

said cover having an elongated slot therein of approximately the same length of trench as said target,

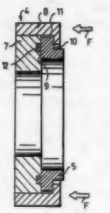
a plate extending at least the length of said slot below said cover,

said plate being transversely inclined to direct water and dirt to a side of said trench.

4,700,953
SLIDE-RING SEAL

Juhani Kuusela, Petäjävesi; Esko Lopperi; Markku Lummila, both of Jyväskylä ; Pertti Saksala, Muurame; Esa Salovaara, Keuruu; Tuomo Suhonen, Jyväskylä ; Perttinä Harri, Jyväskylä ; Esko Poikolainen, Jyväskylä , and Hannu Trygg, Jyväskylä, all of Finland, assignors to Oy Safematic Ltd., Hyrla, Finland

Filed Nov. 6, 1985, Ser. No. 795,647
Claims priority, application Finland, Nov. 6, 1984, 844340
Int. Cl.[4] F16J *15/34*
U.S. Cl. 277—38 **5 Claims**

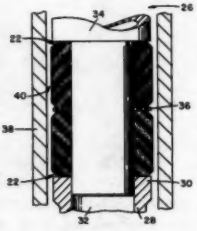


1. In a slide ring seal assembly for a shaft a seal ring having a first annular portion providing a first axial facing flat surface and a second annular portion providing a second axial facing flat surface which is axially spaced from said first surface and which is parallel to the faces said first surface; a slide ring having an axial facing slide for slidably engaging a corresponding slide surface on another slide ring and also having at least two opposite axially facing supporting surfaces which are parallel to said slide surface, said supporting surfaces being held in engagement with said first and second surfaces on said seal ring by a shrinkage fit and there being a radial gap between the outer periphery of said slide ring and the inner surface of said seal ring, the dimension of said gap being large enough that said slide ring is fastened to said seal ring solely by an axial press fit between said supporting surfaces and said first and second surfaces.

4,700,954
RADIALLY EXTENSIBLE JOINT PACKING WITH FIBER FILLED ELASTOMERIC CORE

Richard J. Fischer, Aurora, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Oct. 25, 1982, Ser. No. 436,242
Int. Cl.[4] F16J *15/10, 15/56*
U.S. Cl. 277—165 **7 Claims**



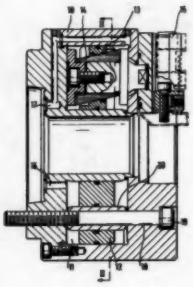
1. In a joint packing of the type with a generally annularly shaped elastomeric core that is radially extensible to effect sealing when externally clamped along a longitudinal axis of the core, the improvement in the core comprising:

an embedded reinforcement of at least about 10 percent by volume of fiber having lengths from about 1 mm to about 12 mm and dispersed in the elastomeric core where some of the fiber is oriented lengthwise to have a reinforcing component along radial lines with respect to the longitudinal axis of the core.

4,700,955
CHUCKS

Joseph F. Jackson, Halifax, England, assignor to Pratt Burnerd International Limited, Halifax, England

Filed Aug. 11, 1986, Ser. No. 895,479
Claims priority, application United Kingdom, Aug. 29, 1985, 8521514
Int. Cl.[4] B23B *31/30*
U.S. Cl. 279—4 **11 Claims**



1. A fluid-operated ram for use in actuating a device such as a chuck, said ram comprising:

a piston moveable along a working stroke, said stroke having a first end and a second end, said device having at least one limiting position which generates a first condition in which flow of liquid is impeded and movement of said piston is halted at a position intermediate said first and second ends of said working stroke, thereby resulting in a build-up of fluid pressure within said ram;

means for relieving pressure within the ram upon generation of a second condition in which movement of said piston is halted upon reaching at least one of said first and second ends and flow of fluid continues, thereby avoiding a build-up of fluid pressure within said ram; and

means for sensing said first condition, thereby indicating said device has reached said at least one limiting position.

4,700,956
LOCKABLE AND SELF-TIGHTENING HAMMER-DRILL CHUCK

Günter H. Röhm, Heinrich-Röhm-Str. 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Dec. 13, 1985, Ser. No. 808,894
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1984, 8436752
Int. Cl.[4] B23B *31/04;* **B25D** *17/08*
U.S. Cl. 279—19.4 **8 Claims**

1. A hammer drill chuck comprising:

a chuck body centered on an axis and formed with an axially forwardly open hole normally receiving a drill bit;

respective jaws displaceable in the body and having front ends radially engageable with a bit in the hole;

an adjustment ring

engaged around the body,

fitting with the jaws such that rotation of the ring in one direction advances the jaws in the body and rotation in the opposite direction retracts the jaws for respectively clamping and unclamping the drill bit between the front ends, and

formed with axially backwardly directed teeth;

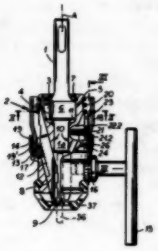
an externally actuatable and accessible locking sleeve axially displaceable on the body and formed with

forwardly directed teeth engageable with the teeth of the ring for rotational coupling of the sleeve and the ring,

an axially relatively short, radially inwardly open, and axially forwardly open slot, and

an axially relatively long, radially inwardly open, and axially forwardly open slot adjacent the short slot and of a predetermined angular width;

a radially outwardly projecting stop fixed on the chuck body and of a predetermined angular width substantially less



than that of the long slot, the stop being engageable in either of the slots and having an angular dimension smaller than the corresponding dimension of the long slot so that when engaged therein the sleeve can move angularly through a predetermined play relative to the body, the stop being so positioned that when engaged in the short slot the teeth of the sleeve are out of engagement with the teeth of the ring; and

means including a spring engaged between the sleeve and the chuck body for urging the sleeve axially forward on the chuck body and for urging the sleeve angularly in the one direction so as to take up the play.

4,700,957

POWER-OPERATED CHUCK

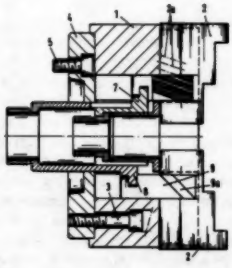
Rainer Kempken, Erkrath, and Hans Stolzenberg, Korschenbroich, both of Fed. Rep. of Germany, assignors to Paul Forkardt GmbH & Co., Düsseldorf, Fed. Rep. of Germany

Filed Aug. 6, 1986, Ser. No. 893,665

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1985, 3528120

Int. Cl.⁴ B23B *31/16*

U.S. Cl. 279—117 **6 Claims**



1. A power-operated chuck, comprising:

a chuck body;

a plurality of clamping jaws that are disposed in said chuck body in such a way as to be radially movable;

first gear means disposed in said chuck body and engageable with said clamping jaws for effecting radial movement of said clamping jaws;

an axially movable drive member that is operatively connected with said first gear means for actuating said first gear means, with said drive member being axially movable in a first position where said first gear means is in engagement with said clamping jaws, and with said drive member being axially movable additionally in a second position where said first gear means is uncoupled from said clamping jaws;

an additional adjustment member that is axially movably disposed in said chuck body; and

second gear means operatively connected with said additional adjustment member and with all of said clamping jaws for effecting radial adjustment of said clamping jaws, when said drive member is in said second position and said first gear means is uncoupled from said clamping jaws, to shift the position of said clamping jaws relative to said first gear means and said drive member; when said drive member is in said first position, said additional adjustment member is carried along in a non-powered state.

4,700,958

DEVICE APT TO PERMIT SKIING ON SNOWLESS GROUND

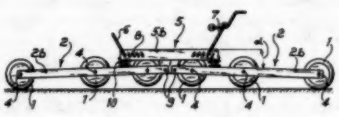
Alberto Volpato, Via Marenco, 3, Milano, Italy

Filed May 15, 1986, Ser. No. 863,516

Claims priority, application Italy, May 15, 1985, 21821/85[U]

Int. Cl.⁴ A63C *5/035*

U.S. Cl. 280—11.1 BT **7 Claims**



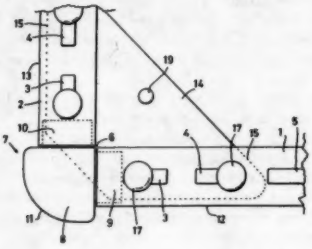
1. Roller suitable to permit skiing practice on snowless ground comprising a front set and a rear set of sliding wheels, first and second connecting element of the wheels of said front and rear sets, respectively, the wheels being rotatably mounted on said respective first and second connecting elements, a central foot supporting element to which said first and second connecting elements are pivotably connected, first and second elastic means interposed, respectively, between said first and second connecting elements and the central foot supporting element, wherein said first and second connecting elements of the front and rear sets comprise, respectively, first and second essentially elongated rectilinear members on which said wheels of said front and rear set, respectively, are longitudinally mounted, a rearward end of said first connecting element facing a forward end of said second connecting element, the facing ends of said rectilinear members being pivotably connected to appendixes disposed rearward and forward, respectively, of said first and second elastic means, said appendixes extending downwardly from essentially the middle of the central foot supporting element, said front set of sliding wheels including at least one end sliding wheel disposed forward of said first elastic means, said rear set of sliding wheels including at least one end sliding wheel disposed rearward of said second elastic means.

4,700,959

CHASSIS

Eriksson Lars, Storgatan 40, S-361 00 Emmaboda, Sweden

Filed May 20, 1985, Ser. No. 736,276
Claims priority, application Sweden, Sep. 30, 1983, 8305359
Int. Cl.[4] B62B 1/00
U.S. Cl. 280—791 R 6 Claims



1. A chassis comprising:

a plurality of elongate frame member means arranged in angular relationship in a plane of extent and providing corners in said chassis,

joining piece means at said corners positioning said frame member means relative to each other,

support means on one of said frame member means and joining piece means for supporting said chassis,

said joining piece means being plate-shaped and extending parallel to said plane of extent and rigidly connected directly to mutually adjacent frame member means,

said frame member means having gaps between mutually adjacent frame member means to permit relative movement between adjacent frame member means,

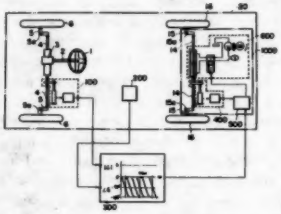
said joining piece means being rigid in said plane of extent and flexible other than in said plane of extent to allow said frame member means to move relative to each other in any direction other than in said plane of extent to permit each of said support means to engage an uneven surface and support said chassis.

4,700,960

APPARATUS FOR CONTROLLING STEER ANGLE OF REAR WHEELS OF VEHICLE

Kazuo Miki, Aichi; Yasutaka Hayashi, Seto; Katsuhiko Fukui, and Kazumasa Sumi, both of Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Apr. 21, 1986, Ser. No. 854,412
Claims priority, application Japan, Apr. 25, 1985, 60-89611
Int. Cl.[4] B62D 7/00
U.S. Cl. 280—91 20 Claims



1. A rear wheel steer angle controlling apparatus for automatically controlling a steer angle of rear wheels of a vehicle by controlling an actuator mechanism for generating the steer angle of the rear wheels in response to an operation of a steering wheel for generating a steer angle of front wheels of said vehicle, said apparatus comprising:

a steering wheel displacement detecting means for detecting a steering wheel displacement and for generating a steering wheel displacement signal representing the steering wheel displacement;

a physical amount detecting means for detecting a physical amount related to a velocity of said vehicle and outputting a physical amount signal; and

a control means adapted to: calculate a speed of operation of said steering wheel on the basis of said steering wheel displacement signal, set a reference value which varies in accordance with said physical amount signal, make a comparison between the speed of operation of said steering wheel and said reference value, and control said actuator mechanism in accordance with the result of the comparison such that:

(a) when the speed of operation of said steering wheel is smaller than said reference value, the steer angle of said rear wheels is generated in the same direction as the steer angle of said front wheels; and

(b) when the speed of operation of said steering wheel is larger than said reference value, the steer angle of said rear wheels is generated in the direction counter to a direction of steer angle of said front wheels.

4,700,961

PROTECTED AUTOMOTIVE BATTERY ACCESS TERMINALS

Harold F. Thomas, 8480 Hyne Rd., Brighton, Mich. 48116, and James M. Deimen, Pinckney, Mich., assignors to Harold F. Thomas, Brighton, Mich.

Filed Mar. 24, 1986, Ser. No. 843,310
Int. Cl.[4] H02G 3/00
U.S. Cl. 280—152 A 6 Claims

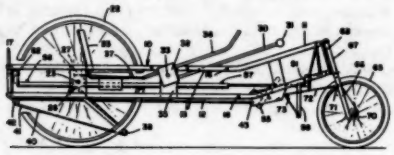
1. In an automotive vehicle including a storage battery therein and an external vehicle body enclosing at least a portion of the vehicle including the storage battery,

the improvement comprising an aperture in the body and a rotatable door in closed position covering the aperture, insulative attachment means extending from the back of the door, a pair of electrically conductive male terminals each of a size sufficient to accept automotive jumper cable alligator clips and each extending from the insulative attachment means, an insulative separator panel extending from the back of the door between the male terminals and substantially parallel thereto and a pair of flexible electrical conduits connecting the pair of terminals to the poles of the storage battery in parallel whereby rotation of the door to open the aperture brings the male terminals into the aperture opening.

4,700,962
ROWING TYPE VEHICLE

James R. Salmon, Fresno, Calif., assignor to Rowcycle, Fresno, Calif.

Filed Jun. 6, 1986, Ser. No. 871,283
Int. Cl.[4] B62M *1/06, 1/14*
U.S. Cl. 280—220 11 Claims

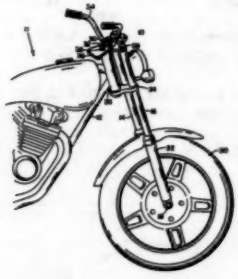


1. A rider propelled vehicle comprising a frame having a frame axis parallel to the direction of travel of said vehicle, a drive wheel including driving means mounted on said frame to rotate on an axle perpendicular to said frame axis, a steerable wheel having an axis of rotation, said steerable wheel mounted on said frame in bearing means defining a steering axis of said steerable wheel with respect to said frame axis, a rail pivotally mounted on said frame to rotate around a rail axis with said rail axis parallel with said frame axis, said rail having a seat mounted thereon, and enlongated operating handle mounted on said frame through pivoting means to move reciprocally through a power stroke and a return stroke, said handle having an upper end and a lower end with said lower end fixed in said pivoting means, and extendible rod slidably mounted in releasable locking means within said pivoting means whereby angular motion of said handle produces corresponding angular motion of said extendible rod, elongated flexible means engaged with said driving means, said elongated means connected at one end to said extendible rod and at the other end to biasing means positioned to bias said handle through said return stroke whereby varying the position of said rod in said pivoting means varies the mechanical force exerted on said driving means through said elongated means during said power stroke, and means connected between said rail and said steerable wheel to move said steerable wheel around its steering axis responsive to rotation of said rail around said rail axis of rotation.

4,700,963
VARIABLE ANGLE STEERING SYSTEM

Steve Burns, 20846 Lamm Rd., Elmendorf, Tex. 78112; Thomas M. Hutchison, 1940 Riverside Dr., Trenton, Mich. 48183, and Henry H. Dertian, 3843 Sheryl Dr., Milan, Mich. 48160

Filed Jul. 21, 1986, Ser. No. 888,852
Int. Cl.[4] B62K *21/02*
U.S. Cl. 280—276 19 Claims



1. A steering system for continuously varying pitch angle of a front fork of a vehicle having a single front wheel, comprising:

a shaft having a first end, a second end, and an intermediate portion, said second end pivotally mounted about a pivot point on a vehicle frame by means of a self-aligning bearing, said shaft being disposed parallel to said front fork;

a lower triple clamp integral with said front fork, having a first hole therein, said lower triple clamp being substantially perpendical to said shaft, and said second end of said shaft passing through said first hole;

a pivot assembly attached to and integral with said vehicle frame, said first end of said shaft passing through said pivot assembly; and

an actuator assembly mounted on said first end of said shaft, attached to said front fork, and coupled with said pivot assembly, whereby any change in yaw of said front fork results in a corresponding change in pitch of said shaft, said changes being simultaneous and continuous for infinite variations.

4,700,964
BICYCLE PIVOT ASSEMBLY

Stanley C. Hess, Somis, Calif., assignor to American Recreation Group, Commack, N.Y.

Filed Jul. 21, 1986, Ser. No. 888,470
Int. Cl.[4] B62H *1/12*
U.S. Cl. 280—289 R 14 Claims

1. A bicycle suitable for freestyle tricks, said bicycle comprising a bicycle frame, said frame including a forward section, a central section, and a rearward section, a first wheel connected to said forward section, a second wheel connected to said rearward section, a seat means connected to said central section, first and second handles connected to said forward section, each of said handles including a handle grip portion, a first and second pedal connected to said central section, wherein at least one of said first pedal, said second pedal, said first handle grip portion and said second handle grip portion includes rotation means for reducing abrasion when said at least one of said handle grips and said pedals contacts the ground when performing said tricks.

4,700,965
BUBBLE APPARATUS FOR WHEELED TOY

Benjamin Kinberg, New York, N.Y., assignor to Empire of Carolina, Inc., Tarboro, N.C.

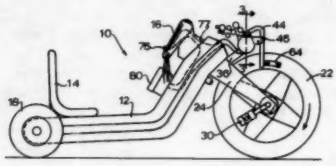
Filed Oct. 21, 1986, Ser. No. 921,275
Int. Cl.[4] B62K *1/00;* A63H *33/28*
U.S. Cl. 280—289 D 5 Claims

1. A child's riding toy for forming bubbles comprising:

(a) a tricycle structure including a chassis, a pair of rear wheels, a relatively large front wheel, a pair of handlebars and a fork connected to said handlebars and mounting said front wheel;

(b) a reservoir supported on and outwardly from said fork and above said front wheel;

(c) a dip-arm pivotally mounted on said reservoir for movement about a transversely extending axis, said dip-arm having an aperture defined by a film support for supporting the boundaries of bubble pouring film located on said film support and covering said aperture, said dip-arm being supported for movement between a first position in which said film support dips into said reservoir to form a film over said aperture and a second position in which said film support, aperture and the film formed thereon are above said reservoir;



(d) a spring mounted on said reservoir and operative to force said dip-arm to said second position;

(e) actuating means on said front wheel for engaging and pivoting said dip-arm to said first position against the tension of said spring on each rotation of said front wheel;

(f) a fan mounted on an electric motor drive adjacent said reservoir and having an outlet to force air circulated by said fan through said aperture when said dip-arm is in said second position and said fan is operated; and

(g) an interconnected switch, battery supply and associated wiring for operating said fan, said switch being mounted on a selected one of said handlebars.

4,700,966

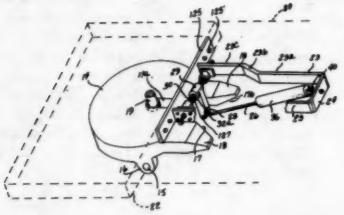
ANTI-JACKKNIFING CONTROL SYSTEM, APPARATUS AND METHOD

Wallace H. Hawkins, Greenville, and Calvin B. Gosnell, Travelers Rest, both of S.C., assignors to Red Arrow International Inc., S.C.

Continuation-in-part of Ser. No. 758,677, Jul. 25, 1985, abandoned. This application Apr. 1, 1986, Ser. No. 847,068

Int. Cl.[4] B62D *53/06*

U.S. Cl. 280—432 **51 Claims**



1. An anti-jackknifing apparatus for use in connection with a coupling between a tractor having a fifth wheel with a coupling plate member having a longitudinal slot having a tapered diverging opening defining two spaced ear portions extending rearwardly carried on said fifth wheel of the tractor, and a trailer having a forward frame portion and a connector pin adapted for coupling to said fifth wheel, said apparatus comprising:

a support frame;

said support frame having a transverse forward frame mounting bar secured adjacent a forward end of said support frame for securement to said forward frame portion on said trailer in superposed relation to said slot and to thereby position the apparatus when mounted on said trailer against said forward frame portion and under the trailer in such a position as to locate the forward position of abutment means carried by said support frame;

position control means including abutment means having an abutment stop member, a fluid operated cylinder, lateral support means are adjustable limit means carried by said support frame,

said fluid operated cylinder having an extensible member extending forwardly from one end thereof;

means for securing said fluid operated cylinder within said support frame;

said abutment means being coupled to said cylinder for movement of said abutment stop member between a first position extending into an engagement zone between the spaced ear portions of said slot and a second position wherein movement of said extensible element moves the said abutment stop member out of said engagement zone; and

said lateral support member means being carried within said support frame having a fixed relation thereto and providing lateral support for said abutment means when in said first position where said abutment stop member of said abutment means is normally positioned to arrest relative angular jackknifing movement of said tractor and trailer while permitting limited relative angular back and forth swinging movement therebetween about said connector pin coupling to said fifth wheel when in said first position extending into said engagement zone;

said abutment stop member being mounted for contacting one of the ear portions of said slot of said fifth wheel upon swinging movement and to be driven by said one ear portion and moved from an initial ear-slot-stop member engagement position to another ear-slot-stop member engagement position displaced in the engagement zone plane defined by the ear portions of said fifth wheel where further movement of said tractor and trailer about said connector pin coupling in the direction of swinging is prevented,

said adjustable limit means carried by said position control means for allowing a swinging movement after initial ear-slot-stop member initial contact up to a limit of movement of said abutment stop member where further relative angular swinging movement of said tractor and trailer about said coupling in a swinging direction is prevented by said abutment stop member and said adjustable limit means, and allowing a reverse relative angular swinging movement up to a limit determined by said adjustable limit means.

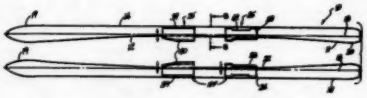
4,700,967

ASYMMETRIC ALPINE SKI WITH OFFSET BOOT PLATFORM

Franklin D. Meatto, Cromwell, and Edward D. Pilpel, Avon, both of Conn., assignors to TriStar Sports Inc., Middletown, Conn.

Continuation-in-part of Ser. No. 808,922, Dec. 13, 1985. This application Mar. 6, 1986, Ser. No. 836,871

Int. Cl.[4] A63C *5/04*

U.S. Cl. 280—609 **16 Claims**

1. In an alpine snow ski, comprising in combination:

(a) a bottom inside edge, the edge having a sidecut;

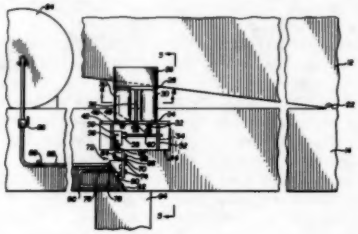
(b) a generally straight bottom outside edge;
(c) a first side connected to the bottom inside edge;
(d) a second side connected to the bottom outside edge;
(e) a front end portion having a shovel connected to the first side and the second side, the shovel further having a tip;
(f) a rear end portion having a tail connected to the first side and the second side, the tail further having a rear edge;
(g) a central portion between the first side and the second side comprising the ski body having a top and a bottom extending a distance between the tip of the shovel and the rear edge of the tail, the distance defining the length of the ski; and
(h) a radius of curvature defining the sidecut, the sidecut being an arc of a circle having a center, the center being the center of the curvature of the sidecut when the ski is placed on horizontal and vertical axes in Cartesian space with the tip of the shovel placed at the origin such that the radius of curvature is defined by the equation $R=[(x-A)^2+(y-B)^2]^{\frac{1}{2}}$ and R is between about 10 feet and about 85 feet.

4,700,968

LIFTABLE AXLE WITH LOAD CONTROL

Herbert J. Cherry, Albion, Pa., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Apr. 7, 1986, Ser. No. 848,977
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—704 **17 Claims**



1. In a vehicle having a frame, a load-bearing body mounted on the frame and a plurality of wheel-bearing axles at a rear portion of the frame and supporting the frame through suspension means, said suspension means having load-control means for selectively rendering one of said axles non-load-bearing or load-bearing, the improvement which comprises:

a sensor means for sensing a load on said load-bearing body, said sensor means comprising at least one rubber spring which yields a predetermined amount when the load on said load-bearing body is above a predetermined amount; and

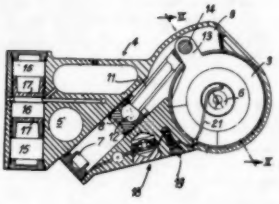
actuator means coupled to said sensor means and to said load cotnrol means for rendering said one axle load-bearing when the load sensed by said sensor means is above a predetermined level and for rendering said one axle non-load-bearing when the load sensed by said sensor means is below a predetermined level.

4,700,969

GROUND CLEARANCE CORRECTOR FOR A SUSPENSION ELEMENT OF A HEAVY VEHICLE

Philippe Joseph, Carpentras, France, assignor to S.A.M.M - Societe d'Applications des Machines Motrices, Bievres, France

Filed Apr. 2, 1986, Ser. No. 847,377
Claims priority, application France, Apr. 3, 1985, 85 05064
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—705 **9 Claims**



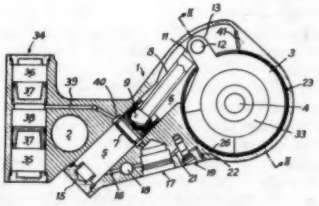
1. A ground clearance corrector for a suspension element of a heavy vehicle, said suspension element comprising an arm for carrying a wheel stub-axle extending therethrough, a fixed part for fixing to the chassis of the vehicle, the arm being pivotally mounted on said fixed part, a hydraulic chamber provided in the arm, a piston slidably mounted in the chamber, a link pivotally mounted on the piston adjacent a first end of the link, the link having a second end opposed to the first end adjacent to which second end the link is pivotally mounted on said fixed part, a cavity provided inside said fixed part, the corrector being adapted to be disposed in said cavity and comprising a hydraulic distributor including a body disposed in said cavity, a sleeve in the body, a slide member rotatively mounted in and extending through the sleeve, a hydraulic circuit formed in the sleeve and in the body for selectively introducing into and withdrawing hydraulic liquid from the chamber of the piston as a function of the angular position of the slide member in the sleeve, the angular position of the sleeve in the body determining a pre-set value of the ground clearance of the chassis of the vehicle, and rotation control means associated with the arm and the chassis and combined with the slide member, the assembly being so arranged as to automatically maintain the ground clearance at the pre-set value determined by the angular position of the sleeve.

4,700,970

SUSPENSION ELEMENT FOR A HEAVY VEHICLE

Philippe Joseph, Carpentras, France, assignor to S.A.M.M. - Societe d'Applications de Machines Motrices, Bievres, France

Filed Apr. 2, 1986, Ser. No. 847,383
Claims priority, application France, Apr. 3, 1985, 85 05067
Int. Cl.[4] B60G *11/30*
U.S. Cl. 280—705 **16 Claims**



1. A suspension element for a heavy vehicle, comprising a

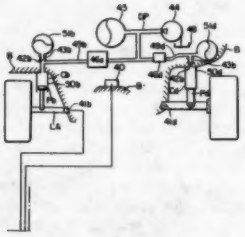
fixed part integral with a chassis of the vehicle, an arm rotatively mounted on said fixed part, a wheel stub-axle of the vehicle extending through the arm, bearing means interposed between said fixed part and said rotary arm, a hydraulic chamber provided in the arm, a slidable piston mounted in said chamber, a link pivotally mounted adjacent a first end of the link on the piston, the bearing means comprising a bearing bush surrounding said fixed part and covered internally with a material for a high resistance dry sliding, an aperture in the bush, a lug of said fixed part radially extending from said fixed part, extending through said aperture and pivotally mounted on said link adjacent a second end of said link opposed to said first end thereof, said aperture allowing the arm to oscillate on each side of said lug.

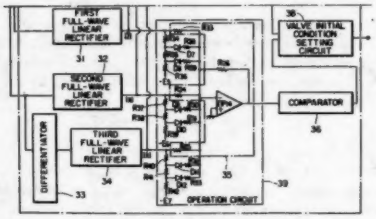
4,700,971

ADJUSTABLE HYDROPNEUMATIC ACTIVE SUSPENSION APPARATUS

Shunichi Doi; Noboru Sugiura; Yasutaka Hayashi, and Yuzo Yamamoto, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed May 20, 1985, Ser. No. 735,972
Claims priority, application Japan, May 21, 1984, 59-102234
Int. Cl.[4] B60G *17/06*
U.S. Cl. 280—707 **9 Claims**





1. An active suspension apparatus using hydropneumatic springs for suspending a body of a vehicle on wheels by utilizing fluid and air pressures, comprising:

acceleration detecting means, located at the floor of a passenger compartment, of a vehicle, for detecting an absolute acceleration Z of said floor corresponding to a vertical acceleration of the floor;

displacement detecting means for detecting a relative displacement X between an axle of the vehicle and the body;

a controller having a differentiator for differentiating the relative displacement X detected by said displacement detecting means and generating a rate X of change in relative displacement as a function of time, an absolute value circuit for calculating absolute values of the absolute acceleration Z, the relative displacement X and the rate X of change in relative displacement X, an operation circuit for multiplying the absolute values |Z|, |X| and |X| from said absolute value circuit with predetermined coefficients, respectively, and producing an output signal from the sum of the absolute values which have been multiplied by the coefficients, and a comparator for comparing an output signal from said operation circuit with a reference value and generating a signal representing the state of the road surface on which the vehicle travels and the travel state of the vehicle; and

driving means for controlling an opening of a restrictor arranged between each hydropneumatic spring chamber and a corresponding actuator in accordance with the signal from said controller,

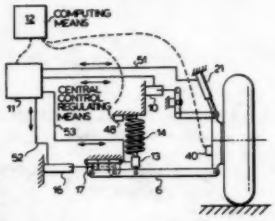
whereby damping force characteristics are controlled in accordance with the road surface state and the travel state.

4,700,972

COMPUTERIZED, CENTRAL HYDRAULIC, ELECTRONIC VARIABLE SUSPENSION

Colin G. Young, 1368 Glen Rutley Circle, Mississauga, Canada L4X 1Z6

Filed Jun. 13, 1986, Ser. No. 873,987
Claims priority, application Australia, Jun. 20, 1985, PH1115
Int. Cl.[4] B60G *17/00;* **B62D** *17/00*
U.S. Cl. 280—707 **5 Claims**



4. For use in a vehicle having a plurality of wheels, a suspension system comprising:

a plurality of body-roll-sensing means, each corresponding to a particular wheel and determining and providing body-roll input relating to lateral body-roll of the vehicle in a region proximate the particular wheel;

a plurality of vertical-control means, each corresponding to a particular wheel and controlling a vertical distance between the particular wheel and a chassis;

a computing means which receives the input from each of the body-roll-sensing means, processes the inputs corresponding to at least one selected wheel, and provides a vertical-output to the vertical-control means for controlling the vertical position of the at least one selected wheel;

a plurality of vertical-acceleration-sensing means, each corresponding to a particular wheel and determining and providing vertical-acceleration input relating to vertical-acceleration of the vehicle in the region proximate the particular wheel;

a plurality of variable positioned fulcrums, each corresponding to a particular wheel and connected to the chassis by a piston and cylinder, and wherein varying a position of the variable-positioned fulcrum varies an effective spring rate constant of the vehicle corresponding to the particular wheel;

a plurality of positioning means, each corresponding to a particular wheel and for varying the position of the variable-positioned fulcrum;

the computing means receiving and processing the vertical-acceleration inputs, and computing a forced vibrational input over time for at least one selected wheel; and

the computer means providing a fulcrum-output to the posi-

tioning means corresponding to the selected wheel to vary the position of the variable-positioned fulcrum.

4,700,973

TRIGGER SYSTEM FOR A VEHICULAR PASSENGER RESTRAINT SYSTEM

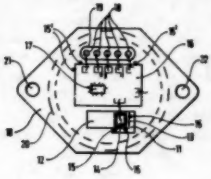
Lothar Gademann, Rottenburg; Bernhard Mattes, Sachsenheim; Eberhard Mausner, Ludwigsburg; Wadym Suchowerskyj, Schwieberdingen, and Norbert Rittmannsberger, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 632,379, Jul. 19, 1984, abandoned. This application Jun. 12, 1986, Ser. No. 873,490

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328114

Int. Cl.[4] B60R *21/32*; G01P *15/09*

U.S. Cl. 280—735 31 Claims



1. In a vehicular passenger restraint system

a trigger system comprising

a deceleration sensing means including a base structure (11, 30) and a deceleration sensing element (12, 12') secured to the base structure and

an evaluation circuit structure (16, 17) including a support carrier (16) and an integrated circuit (17) on the support carrier;

and housing means retaining the deceleraton sensing means and the evaluation circuit structure, including a metal plate (10) forming a single support plate, and a hat-shaped or pot-shaped housing cap (20), the metal plate forming a closure plate for the housing cap and defining a single sealed chamber between the housing cap and the metal plate;

wherein the base structure (11, 30) of the deceleration sensing means is secured to the single metal support plate (10) at a first side of the metal plate;

a bonding plate (14) is provided electrically connected with a terminal of the deceleration sensing means and providing an electrical terminal connection therefor;

and wherein

the support carrier (16) with the integrated circuit (17) thereon lies directly against said first side of the metal support plate and is secured thereto;

wherein the single metal support plate and the housing cap are secured and selaed together to form a sealed air-tight structure defining said chamber therein, within which deceleration sensing means and the evaluation circuit are located ; and

a high viscosity damping material is provided retained in the chamber.

4,700,974

TRIGGERING ARRANGEMENT FOR PASSENGER RESTRAINT SYSTEMS IN MOTOR VEHICLES

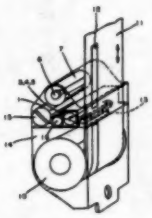
Rudolf Andres, Sindelfingen; Heinz Knoll, Stuttgart; Volker Petri, Aidlingen, and Harald Pfistner, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed May 23, 1986, Ser. No. 866,383

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518502

Int. Cl.[4] B60R *22/36*

U.S. Cl. 280—806 9 Claims



1. A triggering arrangement for vehicle passenger restraint systems, comprising:

acceleration-dependent signal generating means for generating an accident signal in response to vehicle deceleration above a predetermined level,

pyrotechnic driving unit means operably connectible to actuate a passenger restraint system component,

power supply means for providing electrical power to the pyrotechnic driving unit means, and

a single electromagnetically shielding housing accommodating said acceleration dependent signal generating means, said pyrotechnic driving unit means and said power supply means, said housing being disposed directly at the restraint system component to be actuated by the pyrotechnic driving unit means.

4,700,975

SKI POLE AND SNOW SUPPORT ELEMENT FOR A SKI POLE

Gero Ehemann, Birkenweg 15, 2833 Gross Ippener, and Klaus Mainz, Vollersweg 9, 2875 Ganderkesee, both of Fed. Rep. of Germany

Continuation of Ser. No. 573,125, Jan. 23, 1984, abandoned. This application May 16, 1986, Ser. No. 865,653

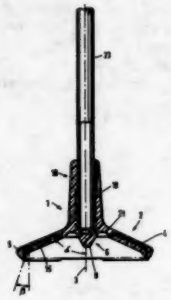
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302556; Jul. 19, 1983, 3325900; European Pat. Off., Nov. 11, 1983, 83111292.5

Int. Cl.[4] A63C *11/24*

U.S. Cl. 280—824 18 Claims

1. A ski pole which comprises a ski pole rod and a snow support element attached to a lower end of the ski pole rod, said snow support element having a downwardly open shell element with a deflecting collar, said shell element having a flank zone and a rim zone, said snow support element further having a structural element adapted to the shape of the shell element located within the flank zone and extending through the rim zone and having a protruding edge protruding downwardly out of the rim zone, said snow support element further having a conical center protrusion pointing downward past the lower end of the ski pole rod in the vicinity of its center line,

whereby during use a downward portion of the rim zone and the protruding edge of the structural element contact a snow surface to prevent slippage of said pole with respect to said snow surface.



4,700,976

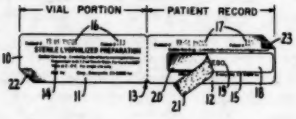
BLIND LABEL

Joachim Loose, Petaluma, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Filed Mar. 7, 1986, Ser. No. 837,471

Int. Cl.[4] B42D *15/00, 9/00;* **B31F** *5/00;* **B32B** *7/00*

U.S. Cl. 283—101 **13 Claims**



1. In a blinded label having a combination of open text and blinded text arrayed upon adhesive-backed label stock, said label stock being present as two sections joined by a tearable separation zone, the improvement comprising presenting at least a portion of the blinded test on the second of the two sections and differentiating the adhesive on the two sections such that the adhesive on the back of the first section is greater in strength than the strength of the adhesive on the back of the second section, said adhesive on the back of the first section being of a strength to render first section permanently affixable to the container to be labeled and said adhesive of the back of the second section being of a strength of render said second section strippably affixable to the container or to the first section by means of its adhesive backing.

4,700,977

MOVABLE MOLDING FOR A VEHICLE

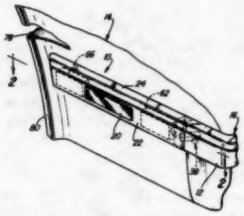
Mark C. Hlavach, Sterling Heights, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 8, 1986, Ser. No. 939,195

Int. Cl.[4] B60R *19/08*

U.S. Cl. 293—126 **5 Claims**

1. A movable molding for a vehicle having a body and a bumper mounted on one of the forward and rearward ends thereof, energy absorbing structure mounting the bumper to the vehicle, said energy absorbing structure biasing the bumper to a normal position but permitting movement of the bumper toward the vehicle upon impact, said bumper having an end portion extending around a side of the vehicle body, said molding comprising a relatively rigid element having an underside and an exterior side, the molding lying on the exterior of the vehicle body in alignment with, and adjacent to, said bumper end portion, fastening means securing the molding to said bumper end portion, slide element means connected to the vehicle body, one of the slide element means and molding having projection structure thereon and the other of the slide element means and the molding having longitudinally extending recess means thereon, the projection structure being received within the recess means and maintaining the molding in position relative to the vehicle body while permitting the molding to slide in the direction of the bumper movement, the bumper end portion adapted to move the molding on the slide element means when the bumper is moved towards the vehicle upon impact and move the molding back to its original position upon retraction of the bumper end portion after impact, the recess means having a cam surface angled outwardly away from the vehicle from a point intermediate the ends of the molding to a point more remote from the bumper end portion, the cam surface contacting the projection structure during sliding of the molding and causing the end of the molding remote from the bumper end portion to move away from the vehicle body and thereby avoid damaging contact with any outwardly projecting vehicle body structure which lies in the path of the molding.



4,700,978

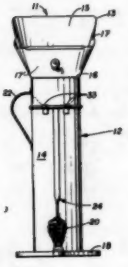
FIREPLACE ASHES REMOVAL DEVICE

Jack Saum, 22609 Dog Bar Rd., Grass Valley, Calif. 95949

Filed Sep. 25, 1986, Ser. No. 911,516

Int. Cl.[4] A47F *13/08*

U.S. Cl. 294—9 **15 Claims**



1. A device for the collection and temporary storage of residues from a fireplace comprising:

a. a shovel portion and

b. a container portion

wherein the shovel portion comprises a scoop shovel body having a generally flat base and spaced rearwardly from the front edge of said base, an integrated top and side walls that cover a major portion of said base, said shovel being open at the front and back thereof, the enclosed area constricting to a tubular zone defining a throat for delivery of residue material to a container,

disposed rearwardly of said base is a tongue adapted to fit within said container portion, and a handle means on the shovel portion comprising a reciprocal moving shocker to urge captured materials rearwardly;

and wherein said container portion comprises;

a tubular section, open at one end, and closed off at the other end by an end cap, said tubular section, having a cross section adapted to receive the tubular zone of said shovel portion;

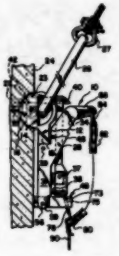
a foot secured at said end cap transverse to the length of the tubular section to provide vertical stability to said device.

4,700,979

APPARATUS FOR LIFTING CONCRETE PANELS

Peter D. Courtois, Centerville, Ohio, and Robert E. Truitt, Carson, Calif., assignors to Dayton Superior Corporation, Miamisburg, Ohio

Filed Oct. 16, 1986, Ser. No. 920,103
Int. Cl.[4] B66C *1/36, 1/66*
U.S. Cl. 294—89 **7 Claims**



1. In an apparatus for lifting precast concrete panels of the type including a lifting body having a forward portion adapted to fit within an anchor recess and engage an anchor head, a latch yoke pivotally connected to a rearward end of said lifting body and including a safety latch cooperating with said forward portion to lock an anchor head to said forward portion when said latch yoke is pivoted to a locked position, a release yoke pivotally attached to said lifting body and including means for urging said latch yoke to pivot to a release position wherein said safety latch is displaced from said forward portion, and a lifting bail pivotally attached to said forward portion, the improvement comprising:

means extending between a rearward end of said latch yoke and said rearward end of said lifting body, and positioned rearwardly of said urging means and said pivot connections between said lifting body, latch yoke, and release yoke, for preventing pivotal movement of said latch yoke relative to said lifting body when said latch yoke is in said locked position, thereby locking said apparatus to said anchor head.

4,700,980

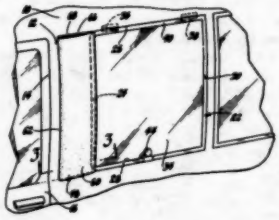
WIND DEFLECTOR FOR VEHICLE SIDE WINDOW

Thadius F. Jozefczak, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1986, Ser. No. 931,233
Int. Cl.[4] B62D *35/00*
U.S. Cl. 296—1 S **3 Claims**

1. A wind deflector for a vehicle window of the type having a window pane top edge hingedly mounted at the top of the window opening and a toggle mechanism acting between the bottom edge of the window pane and the bottom of the window opening so that the window pane is movable between a normal closed position generally flush with the vehicle body and an open position in which the bottom edge is swung outwardly away from the vehicle so that the leading edge of the window pane is spaced away from the forward edge of the window opening by a gap which is progressively wider from the top to the bottom, said wind deflector comprising:

first and second generally rectangular deflector panels of yieldable material overlying one another with the inner panel attached to the leading edge of the window pane and extending forwardly therefrom and the outer panel attached to the vehicle body along a generally vertical



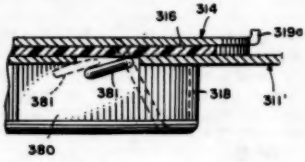
line forward of the forward edge of the window opening and extending rearwardly therefrom, said panels overlying one another in close spaced streamlining relation with the vehicle body when the window is closed and causing one another to yield upon opening movement of the window so that the panels overlie one another and bridge the gap between the leading edge of the window pane and the vehicle body to streamline and deflect the oncoming airflow.

4,700,981

PAINT DRAIN CLOSURE AND VEHICLE PANEL

Peter G. Seyler, Franklin Park, Ill., assignor to Perfection Spring & Stamping Corp., Mt. Prospect, Ill.

Continuation-in-part of Ser. No. 794,653, Nov. 4, 1985, abandoned. This application Oct. 6, 1986, Ser. No. 915,728
Int. Cl.[4] B60J *9/00*; B62C *1/00*; B62D *23/00, 39/00*
U.S. Cl. 296—1 F **16 Claims**



1. A closure for sealing a paint drain hole in a planar portion of a vehicle body panels, said closure comprising a deformable sheet metal plug of inverted hat-shaped configuration; said plug being formed in one piece and having an imperforate bottom wall, a continuous side wall projecting upwardly from the outer limits of, said bottom wall, and a generally planar continuous perimetric flange extending outwardly from the upper end of said side wall; said side wall being curved along a substantial portion of its perimetric extent and including at least two perimetrically-spaced indented wall portions lying within a projected continuation of the curvature of said side wall; each indented wall portion having an elongated outwardly-projecting integral camming rib disposed within said projected continuation of curvature of said side wall and a thermoplastic sealant ring secured to the underside of said flange; said ribs being sloped relative to said perimetric flange and spaced from said perimetric flange a distance exceeding the thickness

of said sealant ring but less than the combined thicknesses of the sealant ring and the panel at said hole; said sealant ring being heatable to expand and adhesively bond to both the underside of said flange and the planar portion of said panel adjacent said hole therein.

4,700,982

OPEN-TOP VEHICLE HAVING A POWER OPERATED ROOF STRUCTURE

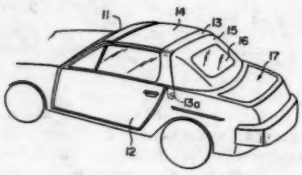
Koji Kuraoka; Morio Umeda; Takeshi Konishi, and Takanori Tuchiya, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 25, 1986, Ser. No. 855,634

Claims priority, application Japan, Apr. 27, 1985, 60-91437

Int. Cl.[4] B60J *7/11, 7/12;* **B60R** *21/13*

U.S. Cl. 296—107 **11 Claims**



1. An open-top vehicle including a body section, retractable pillar means movable between an extended position where the pillar means extends above a rear portion of the body section and a retracted position where the pillar means is retracted into the rear portion of the body section, drive means for moving the pillar means between the extended position and the retracted position, vehicle speed detecting means for detecting running speed of the vehicle, prohibiting means responsive to the running speed of the vehicle for prohibiting the drive means to move said pillar means at least from one of the extended position and the retracted position to the other, said pillar means being of a substantially inverted U-shape having leg portions pivotably connected with said body section for movement between an erected position which corresponds to said extended position of the roof means and a retracted position, foldable hood means connected with said pillar means and adapted for covering a rear top portion of said body section, said foldable hood means having transparent means providing rear window means, roof panel means of a rigid structure for covering a front top portion of the body section, said drive means including motor means having output shaft means and link means including a link having one end articulatedly connected with the output shaft means and the other end pivotably connected with said leg portion of the pillar means at a position rearward of a position where said leg portion is connected with the body section.

4,700,983

CONSTRUCTION OF BODY OF MOTOR VEHICLE

Eiichi Kinaga, Toyota, and Daiichi Shiraishi, Seto, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 31, 1985, Ser. No. 793,154

Claims priority, application Japan, Nov. 2, 1984, 59-167012[U]

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

Int. Cl.[4] E05F *1/08;* **E05D** *15/32*

U.S. Cl. 296—146 **20 Claims**

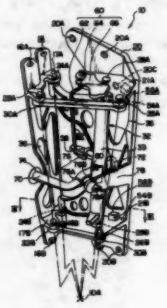
1. A construction of a body of motor vehicle, having a side door hinge mechanism comprising:

rotary center shafts on a side door, supported at two positions spaced apart from each other in the generally horizontal direction on an end panel on the a rocking proximal end of the side door;

rotary center shafts on a vehicle body, supported at two positions spaced apart from each other in the generally horizontal direction on a surface on the vehicle body, adjacent said end panel;

a first arm rotatably connected at opposite ends thereof to one of the rotary center shafts on the vehicle body and one of the rotary center shafts on the side door; and

a second arm rotatably connected at opposite ends thereof to rotary center shafts on the vehicle body and to rotary center shafts on the side door; wherein



a forward end corner portion of said end panel of the side door on the inboard side is raised more forwardly on the vehicle body than the rear end of a surface of the end panel, where a side door hinge is secured, to thereby provide a raised portion;

said raised portion is secured thereto with a weather strip, with which a weather strip contact surface on the side of the vehicle body comes into pressing contact in the widthwise direction of the vehicle body when the side door is fully closed.

4,700,984

CONSTRUCTION OF BODY OF MOTOR VEHICLE

Eiichi Kinaga, Toyota, and Daiichi Shiraishi, Seto, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 31, 1985, Ser. No. 793,150

Claims priority, application Japan, Nov. 2, 1984, 59-167013

The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.

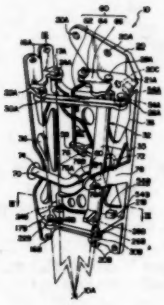
Int. Cl.[4] E05F *1/08;* **E05D** *15/32*

U.S. Cl. 296—146 **24 Claims**

1. A construction of a body of a motor vehicle, having a side door hinge mechanism comprising: a pair of rotary center shafts on the side of a side door, supported in a manner to be spaced apart from each other in the generally horizontal direction on an end face of the side door on the side of a rocking proximal end thereof, a pair of rotary center shafts on the side of a vehicle body, supported in a manner to be spaced apart from each other in the generally horizontal direction on a surface disposed outwardly in the widthwise direction of the vehicle body on the side of the vehicle body and adjacent to said end face, a first arm rotatably connected at opposite ends thereof to the rotary center shafts at cne side, disposed outwardly in the widthwise direction of the vehicle body on the sides of the vehicle body and the side door, a second arm rotatably connected at opposite ends thereof to the rotary center shafts on the sides of the vehicle body and the door; and

a rear end portion of a front side fender is located at a position adjacent to and in front of the forward end of the side door; wherein

a portion of an end face of the side door, disposed outwardly in the widthwise direction of the side door is extended forward from an end face body to a position disposed



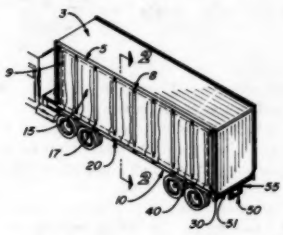
outwardly of the front rotary center shafts on the side of the vehicle body, along the outer surface of the side door, to thereby form an extension for covering the outer surface of the side door hinge mechanism.

4,700,985

ROLL-UP COVER FOR OPEN-SIDED TRAILER

Jerald M. Whitehead, Idaho City Stage Route, Boise, Id. 83706

Filed Jun. 17, 1985, Ser. No. 745,230
Int. Cl.[4] B60J *5/06*
U.S. Cl. 296—181 **16 Claims**



1. Apparatus for covering an open-sided trailer box comprising:

a top rail extending substantially the length of said box; a bottom rail extending the substantial length of said box, said bottom rail provided with one or more slots;

a flexible cover immovably affixed to and downwardly depending from said top rail for covering the side opening;

a plurality of laterally spaced vertical straps downwardly depending from said top rail; each of said straps receivable within a respective slot of said bottom rail;

at least one winch affixed to said trailer box, each of said winches operable to engage one or more of said straps for placing tension thereon;

a torque tube, horizontally extending and rotatable about a horizontal axis, affixed to said cover and said torque tube movable in a vertically upward direction for winding said cover thereon for opening the side of said trailer box and movable in a vertically downward direction for unwinding said cover therefrom for closing the side of said trailer box and;

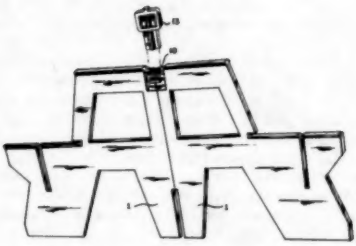
means for rotating said torque tube to open or close said cover.

4,700,986

COLLAPSIBLE, PORTABLE TOTE-TABLE

Lincoln R. Davis, Lincroft, and Louis Flax, Long Branch, both of N.J., assignors to LOPAT Enterprises, Inc., Wanmassa, N.J.

Filed Dec. 8, 1986, Ser. No. 938,804
Int. Cl.[4] A47B *39/00*
U.S. Cl. 297—157 **4 Claims**



1. A portable, collapsible table having a top and seats, said table being formed by integrating a series of interlocking parts, said parts comprising three essentially equal dog elements, six essentially equal grooved plank elements and six essentially equal upright members, each of said upright members having one vertical edge designed to accept one of said dog elements so that pairs of upright members may be connected by one of said dog elements to form legs, and interlocking slots to permit each pair to be connected to each other, wherein after said upright elements are paired and interconnected with each other by said dogs and said slots, an upright pedestal is formed therefrom, and wherein each of said upright members has at least three essentially parallel supporting edges comprising:

(a) a ground contacting supporting edge;

(b) a seat supporting edge; and,

(c) a top supporting edge,

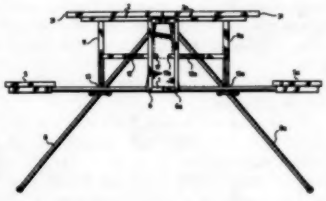
wherein said seat and said top supporting edges are designed so as to mate with said grooved plank elements in a manner such that seats and a top are formed to make up said table.

4,700,987

FOLDING TABLE MECHANISM

Stanko Sraka, 267 Jeffcoat Drive, Rexdale, Ontario, Canada M9W 3E4, and Robert Sraka, 5 Chalfont Road, Rexdale, Ontario, Canada (M9W 3S1)

Filed Dec. 31, 1986, Ser. No. 948,117
Int. Cl.[4] A47B *3/14*
U.S. Cl. 297—159 **12 Claims**



1. A folding table comprising:

(a) a riser frame,

(b) a table top support pivotally secured to said riser frame about a first horizontal axis for pivotal movement between a horizontal operative position and a folded storage position,

(c) seat means pivotally secured to said riser frame about a second axis, parallel to and below said first horizontal axis, for pivotal movement of the seat means generally parallel to movement of said table top support,

(d) leg means pivotally secured to said riser frame about a third parallel axis for pivotal movement of the leg means below said table top support between an extended position, in which said leg means forms an acute angle with the table top support and supports said table in operative position, and a folded storage position, said third parallel axis optionally being co-axial with said first horizontal axis,

(e) a generally vertical table top brace means pivotally connected to said seat means at a first end thereof to pivot about a fourth parallel axis in spaced relation to said second axis and slidably received at the second end thereof in said table top support for sliding movement in the plane of said table top support means, and

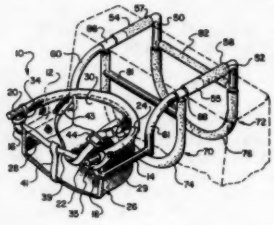
(f) link means pivotally connected to said riser frame at a first end thereof to pivot about a fifth parallel axis intermediate said first axis and said second axis and slidably received at the second end thereof in said table table top brace means for sliding movement along a portion of the length of said table top brace means, wherein said leg means is slidably received in said link means for sliding along a portion of the length of said link means between a first position, in which said leg means supports said seat means in a generally horizontal position, and a second position in which said leg means is in a folded storage position.

4,700,988

INFANT SEAT

Roger A. Meyers, 1150 B. Westlake Blvd., Westlake Village, Calif. 91361

Filed Aug. 5, 1986, Ser. No. 893,391
Int. Cl.[4] A47D *1/10*
U.S. Cl. 297—254 **4 Claims**



1. In a seat for supporting an infant comprising supporting means for supporting the infant and attaching means connected to the supporting means for attaching the supporting means to an object, the improvement in attaching means comprising the provision of:

brace means attached to the attaching means for resting on a portion of the object;

a pair of depending arm means, each attached to the brace means for extending on opposite sides of the object below the brace means; and

mounting means between the brace means and the arm means for moving the arm means toward each other against the object,

wherein the brace means comprise a pair of spaced apart tubular brace members at least one of the arm means having a pair of sleeves receiving the tubular brace members such that the sleeves can slide relative to the tubular brace members,

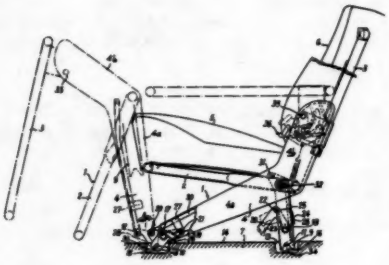
each sleeve having a short portion extending from the arm means toward the supporting means and a long portion extending from the arm means toward the other arm.

4,700,989

MOVABLE SEAT, PARTICULARLY A REMOVABLE VEHICLE SEAT

Jose A. Ercilla, Meru, France, assignor to Sable and Matra Automobile, Paris, France

Continuation of Ser. No. 663,177, Oct. 22, 1984, abandoned.
This application May 7, 1986, Ser. No. 873,672
Claims priority, application France, Oct. 25, 1983, 83 16958
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—331 **16 Claims**



1. A movable seat assembly suitable for use as a removable vehicle seat, said seat assembly comprising:

seat structure having front seat legs and rear seat legs, each of said legs including a fork member cooperable with a fixed attachment rod of a frame supporting the seat assembly, said frame having an upper surface;

a movable lock member on each said front seat leg and rear seat leg for locking said leg on the corresponding attachment rod;

return biasing means for urging each of said lock members into a locked position on the corresponding attachment rod;

manually operated means for actuating each of said lock members into an unlocked position, against said return biasing means in order to release the seat legs with respect to the corresponding attachment rod, said seat assembly being movable between a lowered position and an uptilted position, said manually operated means of the rear lock members being operable in any position of the seat assembly, said manually operated means of the front lock members being operable only when the seat assembly is in its said uptilted position, in order to prevent unlocking of said front seat legs when a passenger is seated on the seat assembly;

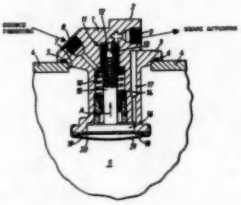
a control rod system movable with respect to said seat structure and said frame during motion of the seat assembly between said lowered and uptilted positions, said control rod system comprising a stop member for locking said manually operated means of the front lock members when the seat assembly is not in its uptilted position, and for releasing said manually operated means of the front lock members when the assembly in its uptilted position.

4,700,990

BRAKE PRESSURE CONTROL VALVE

Desmond H. J. Reynolds, Sutton Coldfield, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Feb. 24, 1986, Ser. No. 832,386
Claims priority, application United Kingdom, Feb. 22, 1985, 8504636
Int. Cl.[4] B60T *8/18, 13/00*
U.S. Cl. 303—6R 9 Claims



1. A brake pressure control valve for use on a vehicle having a pressurized fluid self-levelling suspension system, the valve comprising: a valve body constructed and arranged to be sealingly secured to the wall of a pressure chamber of the suspension system to close an aperture in the wall whereby a portion of the control valve body is located within the pressure chamber and is exposed to the pressure prevailing within the pressure chamber; a valve set located within the valve body to control communication between an inlet connectable to a source of brake actuating fluid and an outlet connectable to a brake actuator; a control member exposed to the pressure prevailing within a control chamber defined within the portion of the valve body located within the pressure chamber, the control member being coupled to the valve set to render operation of the valve set dependent upon the pressure prevailing within the control chamber; and a small orifice fluidically connecting the control chamber to the pressure chamber, said orifice being of a size to provide limited communication between said control chamber and said pressure chamber in order to isolate the former from rapid fluctuations of pressure in the latter.

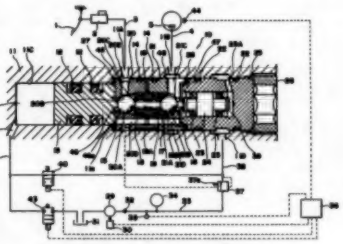
8. A brake pressure control valve for use on a vehicle having a pressurized fluid self-levelling suspension system, the valve comprising: a valve body constructed and arranged to be sealingly secured to the wall of a pressure chamber of the suspension system to close an aperture in the wall whereby a portion of the control valve is exposed to the pressure prevailing within the pressure chamber; a stepped bore defined within the valve body; a valve set located in the stepped bore to control communication between an inlet connectable to a source of brake actuating fluid and an outlet connectable to a brake actuator; a control member exposed to the pressure prevailing within a control chamber defined within the valve body, and coupled to the valve set to render operation of the valve set dependent upon the pressure prevailing within the control chamber; a cup secured to the valve body and forming one end of the valve, the cup being effective to hold the valve set and control member captive within the stepped bore and itself forming one wall of the control chamber; and a small orifice fluidically connecting the control chamber to the pressure prevailing within the pressure chamber.

4,700,991

VALVE ASSEMBLY FOR BRAKE FLUID PRESSURE CONTROL

Takumi Nishimura; Tadao Saito; Nobuyasu Nakanishi, and Noboru Noguchi, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Jan. 22, 1986, Ser. No. 820,968
Claims priority, application Japan, Jan. 23, 1985, 60-008174[U]
Int. Cl.[4] B60T *8/42*
U.S. Cl. 303—113 18 Claims



1. A valve assembly for brake fluid pressure control in a system having a brake master cylinder and a wheel brake cylinder, comprising:

a body having an inlet port connected to the brake master cylinder, an outlet port connected to the wheel brake cylinder, and a cylinder bore communicating the inlet and outlet ports;

a first seat member having an axially extending bore and a seat surface and fitted securely in the cylinder bore in sealed relation with respect to a wall surface of the cylinder bore;

a second seat member having an axially extending bore and a seat surface and fitted securely in the cylinder bore in sealed relation with respect to the wall surface of the cylinder bore and adjacent to said first seat member;

a third seat member having a seat surface, a first end portion securely fitted into the bore of said first seat member and a second end portion securely fitted into the bore of said second seat member for forming first and second valve chambers inside said first and second seat members, respectively;

first and second valve elements accommodated in said first and second valve chambers, respectively;

first and second passageway means arranged in parallel each for connecting the inlet port to the outlet port through the first and second valve chambers in succession;

spring means for bringing the first valve element into contact with the seat surface of said first seat member to cut off said first passageway means, and for separating the second valve element from the seat surface of said third seat member to open said second passageway means and bringing said second valve element into contact with the seat surface of said second seat member for cutting off said first passageway means;

a pressure reducing piston for separating the first valve element from the seat surface of said first seat member against said spring means; and

a by-pass piston for separating the second valve element from the seat surface of said second seat member and bringing said second valve element into contact with the seat surface of said third seat member against said spring means;

said third seat member having first and second annular grooves formed in its outer periphery and fitted with seal rings for providing a seal between the outer periphery of

said third seat member and wall surfaces of the axially extending bores of said first and second seat members, respectively;

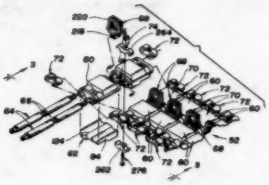
the first and second end portions outwardly of said first and second annular grooves, respectively, of said third seat member having an outer diameter which will provide clearance between said first and second end portions and the wall surfaces of the axially extending bores of said first and second seat members, respectively.

4,700,992

ENDLESS TRACK AND COMPONENTS THEREOF FOR TRACK LAYING VEHICLE

Robert M. Cory, Roseville, Mich., assignor to General Dynamics Land Systems, Inc., Warren, Mich.

Filed Jul. 3, 1985, Ser. No. 752,186
Int. Cl.[4] B62D *55/20, 55/28*
U.S. Cl. 305—51 **19 Claims**



1. A shoe for an endless track of a track laying vehicle, said shoe comprising: a binocular-shaped shoe housing including a pair of housing members with the same cross section as each other; said shoe housing members having formed sheet metal defining a pair of elongated pin openings each of which has a generally round cross section; said shoe housing members having flanges engaged with each other and defining a web that extends between the elongated pin openings; a connection that secures the shoe housing members to each other; said shoe housing also including a pair of end plates that cooperate in securing the pair of housing members to each other; a road-wheel pad of resilient material molded in situ on one side of the shoe housing; a replaceable road pad of resilient material; and a detachable connection for securing the replaceable road pad to the shoe housing on the opposite side thereof as the road-wheel pad.

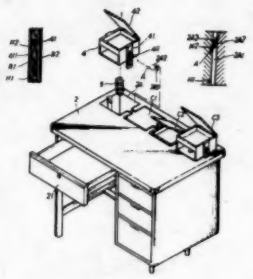
4,700,993

AUXILIARY DRAWER STRUCTURE ON TOP SURFACE ON A DESK

Chung Fu-Long, No. 139, Chung Chen Road Sec. 1, Changhua City, Taiwan

Filed Feb. 10, 1987, Ser. No. 13,062
Int. Cl.[4] A47B *51/00*
U.S. Cl. 312—312 **5 Claims**

1. A desk top face auxiliary drawer structure utilizing the surplus space in the rear portion of a desk, which comprises of several openings furnished on the top surface by the rear side portion of a desk; corresponding number of base boards furnished underneath the said openings at a proper depth; corresponding number of drawer bodies to be inserted into the said openings; corresponding number of extension/compression springs to be installed between each said base board and the bottom side of each said drawer body; guiding blocks furnished on both left and right sides of each said drawer body; guiding troughs furnished on both left and right sides of each openings as they are utilized to receiving said guiding blocks when each said drawer is inserted into each said openings; guided swinging and positioning devices, each device comprises of a runner attached to the lower bent end of guided swinging and positioning rod, a guided swinging and positioning rod, a leaf spring, and these devices are installed on the inner wall of the said troughs, one for each trough; cyclic guiding rails having cyclic trucks, they are attached to the external surfaces of the said guiding blocks, one for each guiding block, and the said guiding rails are utilized to receive the said runners on the lower bent end of the said guided swinging and positioning rod, through the mechanism of the said extension/compression spring, the said guided swinging and positioning devices, and the said cyclic guiding rails and its tracks the drawer bodies can be risen up and locked to its rising-up position or be lowered down and locked to its hiding-out position by pressing the top surface of each drawer body downwardly once after another.

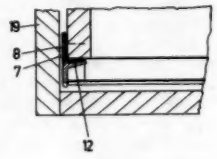


4,700,994

DRAWER INCLUDING SIDE WALLS HAVING FRONT ENDS COVERED BY COVER MEMBERS

Erich Röck, Höchst, and Helmut Hollenstein, Lustenau, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Apr. 1, 1986, Ser. No. 846,815
Claims priority, application Austria, Apr. 26, 1985, 1255/85
Int. Cl.[4] A47B *88/00*
U.S. Cl. 312—330 R **7 Claims**



1. A drawer comprising:

a bottom plate, a rear wall connected to said bottom plate, a pair of side walls connected to said rear wall and within which are to be arranged running rails of a pull-out guide assembly, and a front plate;

a pair of angle members, each said angle member connecting a respective end of said front plate to the front end of a respective said side wall, each said angle member including a first portion extending parallel to the respective said side wall and fastened thereto and a second portion extending parallel to said front plate and connected to the respective said end thereof; and

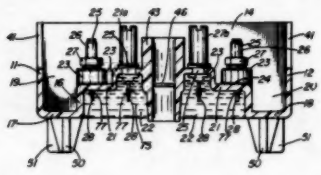
a pair of cover members separate from said angle members, each said cover member being mounted directly on and covering said front end of a respective said side wall, each said cover member including a hook member extending into said respective side wall and engaging with said second portion of said respective angle member, thereby fastening said cover member to said side wall.

4,700,995

POLE MOUNTING CONNECTOR

Albert Kupferschmidt, Highland Park; Tracy D. Greene, Glenview, and Donald F. Jaycox, Deerfield, all of Ill., assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 26, 1986, Ser. No. 844,306
Int. Cl.[4] H01R 11/00
U.S. Cl. 439—276 12 Claims



1. A pole mounting connector for connection of drop-wire conductors to a distribution cable, said connector comprising a body member and a cover pivotally mounted on a side wall; said body member being of rectangular form having end walls and side walls and including a transverse wall extending across the body member and dividing the body member into two parts, a back part and a front part; said transverse wall having a center web portion extending between said end walls intermediate front and back edges of said end walls, a side portion extending along each side of said center web portion at a back edge of each side wall and intermediate portions uniting said center web portion and said side portions to define, with said side walls, a channel along each side of said center web portion; terminals positioned in said center web portion and having front ends in said front part and rear ends in a back chamber in said back part of said body member; means on said front ends of said terminals for connecting drop-wire conductors and means on said rear ends of said terminals for connecting conductors of a stub cable; entry means in one end wall for entry of a stub cable into said back chamber of said back part of said body member; mounting brackets on back surfaces of said side portions of said transverse wall; at least one aperture in said one end wall and communicating with said front part of said body member for entry of drop-wire conductors; said cover comprising a front web and parallel side walls, and pivotal mounting means at one end of each side wall of the cover; said pivotal mounting means on said cover engaged with said body member for pivotal mounting of said cover on said body member.

4,700,996

ZIE EDGE CONNECTOR

Melvin C. August; Stephen A. Bowen, and John T. Williams, all of Chippewa Falls, Wis., assignors to Cray Research, Inc., Minneapolis, Minn.

Filed Oct. 8, 1986, Ser. No. 916,509
Int. Cl.[4] H01R 13/62
U.S. Cl. 439—268 5 Claims

1. An electrical connector, comprising:

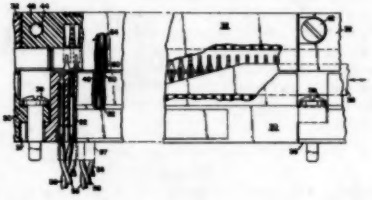
a pair of opposing blocks of nonconductive material, adjacent surfaces thereof having longitudinal slots defining a longitudinal guideway therebetween for receiving a slider;

each block further including a plurality of spaced-apart transverse openings adjoining the slot therein;

a female contact disposed in each transverse opening of each block;

a male contact slidably disposed at one end thereof in each female contact of one of said blocks; and

a cam lobe secured to each male contact and extending into the slot of said one block for sequential selective actuation into and out of sliding engagement at the other end with the opposite corresponding female contact in the other



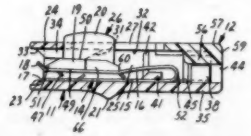
block responsive to insertion of the slider into the guideway.

4,700,997

ELECTRICAL CONNECTOR

Jerome E. Strand, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 14, 1986, Ser. No. 930,494
Int. Cl.[4] H01R 9/07
U.S. Cl. 439—372 12 Claims



1. A connector for removably attaching a flat electrode to a conducting cable, comprising:

clamp means comprising a flat upper jaw and a flat lower jaw each having front and rear ends, said jaws comprising conductive resilient flexible sheet material and having inner facing surfaces spaced from each other at said front end for accepting and retaining a flat electrode therebetween, and joined at the opposite, rear ends by flexible resilient spring means to normally maintain said jaws in an open position, and adapted for pivotal downward movement of said upper jaw toward said lower jaw to an electrode retaining position in which said facing surfaces of said jaws resist movement of said flat electrode retained therebetween, said clamp means adapted for conductive attachment to a conducting cable;

a slide actuator, comprising a generally flat slide plate having a forwardly directed, downwardly sloped front edge and a finger movable member attached to the upper side of said plate for moving said actuator forward and backward;

a housing having a front opening and adapted to contain said clamp means and said slide actuator above said clamp means, said front opening leading to said open front end of jaws within said housing, said housing comprising

(a) a base for supporting said clamp means;

(b) a roof with rearward opening slot therein, said slot adapted for passage of said finger movable member therethrough;

(c) two side members, each joining the corresponding lateral edges of said base and roof; and

(d) slide actuator guide means at or below the underside of said roof, having front and rear generally planar lower surfaces separated by a transition area comprising a forwardly directed ramp angled downwardly from said rear surface to said front surface, wherein first forward movement of said slide actuator forces said actuator

downward along said guide means ramp to motivate said upper jaw pivotally downward to said electrode retaining position, and further forward movement of said slide actuator along said front planar lower surface frictionally locks said slide actuator to maintain said electrode retaining position; and

a closure member abutting the rear of said housing and attached thereto for retaining said clamp means and said slide actuator within said housing, said closure member having an aperture therethrough for carrying said cable to said clamp means.

4,700,998

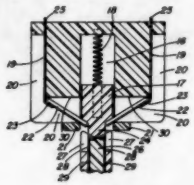
MULTIPLE CONTACT CONNECTOR HAVING A LOW INSERTION FORCE

Jaroslav M. Hvezda, Nepean; Benne Veisher, Ottawa, and Richard J. Middlehurst, Kanata, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 19, 1986, Ser. No. 897,946

Int. Cl.[4] H01R *13/62*

U.S. Cl. 439—325 **15 Claims**



1. A multiple contact connector comprising: two connector members, one connector member for insertion in the other connector member; said other connector member comprising an elongate body member, and a slot extending into said body member from a front surface and extending longitudinally; said connector members forming at least two pairs of spaced surfaces; transverse slots in said front at least two pairs of spaced surfaces; transverse slots in said front surface; contacts on each of said surfaces, said contacts arranged to form pairs of opposed contacts; and a plurality of contact levers pivotally mounted in a connector member, a contact lever in each of said transverse slots, inner ends of said contact levers extending into said slot extending into said body member, each contact lever adapted to extend between and connect a pair of contacts, insertion of said one connector member causing each said contact lever to pivot about an axis transverse to its length, the ends of each contact lever moving in contact with related pair of contacts, to increase the contact normal forces at said contacts as said one connector member is inserted; and a retaining member on each side of said slot extending into said body member, and retaining said contact levers in said transverse slots when said one connector member is withdrawn.

4,700,999

CURRENT LEADTHROUGH

Georg Probst, Geislingen, Fed. Rep. of Germany, assignor to GMT Novotny GmbH, Waldkraiburg, Fed. Rep. of Germany

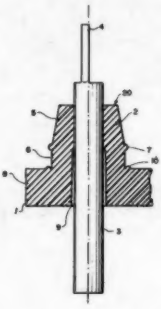
Continuation of Ser. No. 627,422, Jul. 3, 1984, abandoned. This application Aug. 4, 1986, Ser. No. 894,472

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3324466

Int. Cl.[4] H01R *13/52*

U.S. Cl. 439—271 **9 Claims**

6. A current leadthrough for refrigerators, comprising a one-piece insulator including a radially extending base portion and a plurality of axially extending nub portions extending upwardly from a top of said base portion, said nub portions being arranged at spaced locations on said top of said base portion and said base portion extending radially outwardly from said nub portions, a plurality of electrically conductive pins extending through said base portion, each of said pins extending through one of said nub portions, said insulator comprising a thermoplastic material having temperature stability and being insensitive to chemicals and having some elasticity, said base portion and said nub portions being molded in one piece, each nub portion having an axially extending bore therethrough which also extends through said base portion, each bore having a large diameter part in said base portion and in a portion of said nub portion which is larger in diameter than said pin extending through said base portion and each of said



nub portions, each bore also having a small diameter part at a location spaced away from said base portion for tightly engaging around said pin, said small diameter part being entirely in its respective nub portion, said large diameter part of each bore defining an annular space around said pin in the vicinity of said base portion and in the vicinity of part of each nub portion, each nub portion having a cylindrical part surrounding said large diameter part of said bore and a frusto-conical part connected to said cylindrical part and surrounding said small diameter part of said bore.

4,701,000

ELECTRICAL TERMINAL AND METHOD OF ASSEMBLY

Paul W. Suprono, East Greenwich, R.I., assignor to Nortek Corporation, Providence, R.I.

Filed May 3, 1985, Ser. No. 730,297

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—423 **31 Claims**

1. A terminal for making an electrical connection to an electrical conductor comprising

an elongated base, and

a gripper comprising a resilient gripping finger and a back portion connected to said finger,

said gripping finger being arranged to press said conductor into contact with said base,

said gripper being held in a fixed position along the length of said base by the combination of said gripping finger acting in tension to exert a force on said base at first location along the surface of said base, said force being directed along the length of said base, while said back portion acts

in the opposite direction at a second location spaced apart along said length of the base from said first location to resist said force.

4,701,001

CONNECTOR FOR A COAXIAL CABLE

Laurentius M. Verhoeven, Veghel, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1986, Ser. No. 942,187

Claims priority, application Netherlands, Dec. 23, 1985, 8503553; Jan. 10, 1986, 8600041

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—394 9 Claims

1. A connector for a coaxial cable with at least one inner conductor and at least one outer conductor, insultated from said inner conductor by a inner sheath of insulating material, said connector comprising:

a bottom plate of insulating material,

first and second contact elements mounted on said plate, said first and second contact elements being electrically separated and extending parallel to one another upwardly from and perpendicular to said bottom plate, each said first and second contact element also including at one end at least one pin which projects downward through the bottom of said plate.

a first push-on contact means formed at the other end of said first contact element extending upward from the bottom plate, said first push-on contact means adapted to penetrate any insulation material which may surround the outer conductor of the cable and to make electrical contact with said outer conductor,

a second push-in contact means formed at the other end of said second contact element extending upward from the bottom plate, said second push-on contact means adapted to penetrate said inner sheath and to make electrical contact with said inner conductor;

a cap for connection to the bottom plate provided with specially formed inner spaces, said cap including at one end an insertion opening for inserting the coaxial cable into the cap and, in the direction of insertion, a plurality of spaces having internal dimension decreasing successively from said opening and corresponding to the outer dimensions of the end of the coaxial cable which has been stripped in preparation for insertion into the connector, each said space providing at least partial support for the cable end portion received therein when the cap is connected to the bottom plate, and

slots formed in said cap which extend through certain ones of said spaces and which are adapted to receive the upwardly extending push-on contact means of the first and second contact elements when the cap is connected to the bottom plate, thereby causing the push-on contact means to penetrate through said certain ones of said spaces.

4,701,002

EDGE CONNECTOR WITH CLAMPING CONTACT ELEMENTS

Bob Mouissie, Berlicum, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 15, 1987, Ser. No. 3,476

Claims priority, application Netherlands, Jan. 30, 1986, 8600224

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—426 21 Claims

1. A contact element for electrically interconnecting a flexible multiconductor film and a rigid substrate, said contact elements comprising

a fixed arm, a first spring arm and a second spring arm, all extending from a base portion to define approximately an E-shaped structure, said first spring arm being disposed between said fixed arm and said second spring arm;

a first insertion opening formed between said fixed arm and said first spring arm adapted to receive said rigid substrate; and

a second insertion opening formed between said first and second spring arms adapted to receive a flexible thin conductor of said flexible multiconductor film,

whereby the insertion of said rigid substrate into the first insertion opening will bias the first spring arm to exert a pressure force on the flexible thin conductor which has been previously inserted without contact friction force into the second insertion opening, thereby achieving electrical interconnection between the flexible thin conductor and at least one conductor on said rigid substrate.

4,701,003

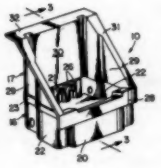
POUCH ASSEMBLY FOR COMPUTER CONTAINER

Victor B. Gruet, San Juan, Philippines, assignor to Computer Information System, Inc., Makati, Philippines

Filed Oct. 14, 1986, Ser. No. 918,450

Int. Cl.[4] H01R *13/00*

U.S. Cl. 439—680 1 Claim



1. A pouch assembly for computer containers comprising a preshaped rectangular and tapered front portion casing defining a lower section and upper section interfitted with the upper portion of said lower section; said lower section having a bottom wall and a peripherally extending front, rear and side walls extending from said bottom wall and terminating at its upper end with an uptanding flange member of said side and rear walls and an inclined flange member at its front wall, and a pair of contact plates disposed within said rear wall; said upper section defines a hollow and tapered front portion casing having a bent front wall, opposed triangular-shaped side walls and rear walls, said rear wall being diametrically larger relative to said front wall, and an outwardly extending flange members integrally formed at the upper terminal portion of said rear and

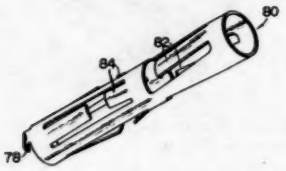
side walls, said walls defining upper and lower open end portion.

4,701,004

RETENTION CLIP FOR ELECTRICAL CONTACTS

Brent D. Yohn, Newport, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 22, 1986, Ser. No. 944,315
Int. Cl.[4] H01R *13/426*
U.S. Cl. 439—871 **6 Claims**



1. A retention clip for removably retaining a contact terminal within a housing passageway of a one-piece housing, comprising:

a cylindrical hollow body section including a cylindrical front section and a cylindrical central section spaced therefrom and joined by a plurality of integral bridging sections extending axially therebetween and spaced circumferentially therearound;

a like plurality of locking lances extending rearwardly from said front section each between two said bridging sections, and each extending radially outwardly to a rearwardly facing free end;

a like plurality of stop means joined to said central section each having a forwardly facing stop surface associated with and spaced from said free end of a respective said locking lance and located radially outward from said body section, said associated pairs of free ends stoppingly cooperable with both sides of an annulus within a housing passageway to comprise clip-retaining means, and said locking lances being deflectable by said annulus during insertion into the passageway from a rearward face of the housing;

a plurality of short tabs extending radially inwardly at a front end of said front section to stoppingly engage a forward annular stop means of a terminal inserted therethrough; and

a pair of terminal-engaging latching projection means extending forwardly from a rear end of said clip and converging gradually radially inwardly to free ends to latch behind a rearward stop means of the terminal when inserted therethrough, said latching projection means being outwardly deflectable by said terminal during terminal insertion and also being outwardly deflectable by tool means inserted along a rearward portion of the terminal to permit terminal removal from the housing.

4,701,005

LIGHT BEAM COMBINING METHOD AND APPARATUS

Masaru Noguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Nakanuma, Japan

Filed Nov. 19, 1984, Ser. No. 673,236
Claims priority, application Japan, Nov. 18, 1983, 58-216334
Int. Cl.[4] G02B *5/32, 26/10*
U.S. Cl. 350—3.7 **12 Claims**

1. A method of combining a plurality of light beams comprising a step of diffracting a plurality of first light beams into a group of second light beams, said second light beams being collimated light beams that advance in parallel to each other in one of partly merged and adjacent fashion, wherein said step of diffracting is performed using an area division type holographic diffraction grating (25),

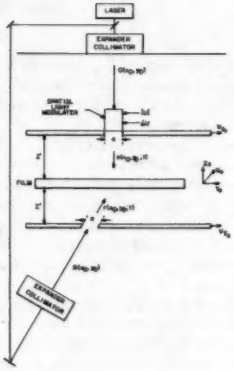
whereby a high intensity beam for scanning a recording medium can be obtained from said second light beams.

4,701,006

OPTICAL-DIGITAL HOLOGRAM RECORDING

Robert J. Perlmutter, Palo Alto, Calif., assignor to Stanford University, Stanford, Calif.

Filed Feb. 20, 1985, Ser. No. 703,521
Int. Cl.[4] G03H *1/08*
U.S. Cl. 350—3.66 **8 Claims**



1. A method of recording a hologram in a recording medium comprising the steps of

calculating samples of a two-dimensional complex field distribution for a diffraction pattern of a three-dimensional object based on a computer model of the object,

providing a recording medium,

providing a first reference coherent light source and

providing a second object coherent light source through use of a laser-visible light source and optics to split light from said laser source into two beams, and expander and collimator means to expand and collimate the two light beams,

modulating a light beam from said second object coherent light source in response to amplitude and phase values of said two-dimensinal complex field distribution samples, and

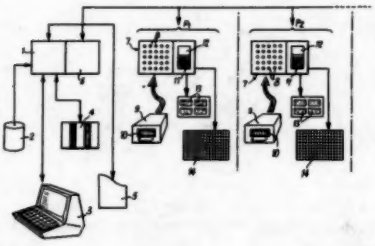
scanning said recording medium with a reference light beam from said first reference coherent light source and with a modulated object beam from said second object coherent light source by providing opaque plates with apertures therein and moving said apertures, said light beams intersecting in said recording medium as said beams are scanned.

4,701,007

SYSTEM FOR THE PRODUCTION OF ELECTRICAL WIRING PARTS

Henri V. J. Jonca, Toulouse, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Continuation of Ser. No. 599,569, Apr. 12, 1984, abandoned. This application Aug. 14, 1986, Ser. No. 896,277
Claims priority, application France, Apr. 23, 1983, 83 06903
Int. Cl.[4] G02B *6/04*
U.S. Cl. 350—96.10 **7 Claims**



1. A system for producing a wiring part consisting of conductors having ends and of at least a connection device having transparent connecting points for said ends, said transparent connecting points having a preselected distribution in relation to each other, said conductors inside said wiring part being identified by conductor codes, the ends of said conductors being identified by end addresses which correspond to said connecting points of said connection device, and each of said conductors having inside said wiring part a path identified by a guiding through code, said system comprising:

(a) a computer associated with a bulk memory in which are stored said conductor codes, said end addresses and said guiding through codes; and

(b) at least a work station for an operator, connected to said computer and to said bulk memory, said work station comprising:

(i) a frame;

(ii) a rack supported by said frame and provided with notches to receive said conductors;

(iii) a movable member displaceable along said rack;

(iv) data input means;

(v) an assembly of selectively controlled light points arranged according to a distribution similar to that of said transparent connecting points of said connection device; and

(vi) display means,

said data input means, said assembly of light points, said connection device and said display means being fixed to said movable member.

4,701,008

OPTICAL WAVEGUIDE INCLUDING SUPERSTRATE OF NIOBIUM OR SILICON OXYNITRIDE AND METHOD OF MAKING SAME

Fred V. Richard, Scottsdale; Fred S. Hickernell, Phoenix, and Frederick Y. Cho, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 10, 1984, Ser. No. 639,634
Int. Cl.[4] G02B *6/10*; H01L *21/00*; B44C *1/22*
U.S. Cl. 350—96.12 **6 Claims**

1. A channel optical waveguide device comprising:

a substrate of Lithium Niobate ($LiNbO_3$) having an index of refraction;

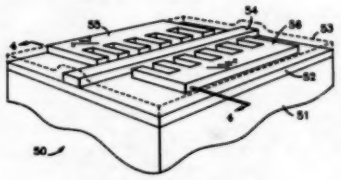
a channel optical waveguide of Titanium (Ti) in diffused Lithium Niobate ($LiNBO_3$) formed on said substrate and having an index of refraction greater than that of said substrate; and

a superstrate of Niobium Oxynitride (NbON) covering said optical waveguide, said superstrate having an index of refraction less than the index of refraction of said optical waveguide.

3. A method of constructing a channel optical waveguide comprising the steps of:

providing a substrate;

placing a buffer layer comprising Silicon Oxynitride (SiON) on said substrate, said buffer layer having a first surface and a first index of refraction;



placing a waveguide comprising Zinc Oxide (ZnO) on said first surface of said buffer layer, said waveguide having a second index of refraction greater than the first index of refraction;

placing an electrode on either side of said waveguide, said electrodes also being placed on said first surface of said buffer; and

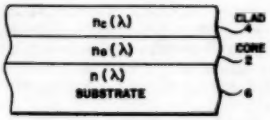
coating said electrodes with a superstrate comprising Silicon Oxynitride (SION), said superstrate having an index of refraction substantially equal to the first index of refraction.

4,701,009

SPECTRAL FILTER FOR INTEGRATED OPTICS

Gregory L. Tangonan, Oxnard, and Huan-Wun Yen, Westlake Village, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 4, 1985, Ser. No. 697,802
Int. Cl.[4] G02B *6/10*
U.S. Cl. 350—96.12 **15 Claims**



1. A spectral filter for an integrated optic application comprising:

a common optical input waveguide capable of receiving a multispectral bandwidth of radiation; and

at least a pair of optical output waveguides integrally communicating with the input waveguide, one output waveguide formed of a low index of refraction material for shorter wavelengths within the multispectral radiation range and the other output waveguide formed of a relatively higher index of refraction material for the same shorter wavelengths, the respective output waveguide materials being interrelated in that they have a common index of refraction for at least one wavelength within the multispectral bandwidth of radiation whereby an incident multispectral bandwidth of radiation is split into a first bandwidth of radiation of wavelengths equal to or greater than the wavelength of the common index of refraction in one output waveguide and a second bandwidth of radiation of wavelengths equal to or lesser than the wavelength

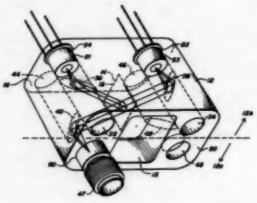
of the common index of refraction in the other output waveguide.

4,701,010

UNITARY BODY OPTICAL COUPLER

Harold Roberts, Westboro, Mass., assignor to ADC Fiber Optics Corporation, Westboro, Mass.

Filed Aug. 30, 1984, Ser. No. 646,004
Int. Cl.[4] G02B 6/26, 6/42
U.S. Cl. 350—96.15 **17 Claims**



1. For use with a light source means for providing a light beam, means for receiving said light beam and an optical filter, an optical coupler comprising:

an optically clear unitary coupler body having a plurality of recesses therein, said optical filter received by a first of said plurality of recesses, said light source means retained by a second of said plurality of recesses, and said means for receiving said light beam retained by a third of said plurality of recesses;

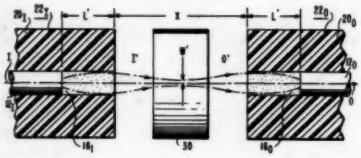
means for reflecting said light beam formed from a surface of a fourth of said plurality of recesses, a first light path for said light beam is defined from said light source means to said beam receiving means by way of reflection from said fourth recess surface and passage through said first recess.

4,701,011

MULTIMODE FIBER-LENS OPTICAL COUPLER

William L. Emkey, Bethlehem-Hanover Township, Northampton County, and Curtis A. Jack, Kutztown-Maxatawny Township, Berks County, both of Pa., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 15, 1985, Ser. No. 691,677
Int. Cl.[4] G02B 6/32
U.S. Cl. 350—96.18 **16 Claims**



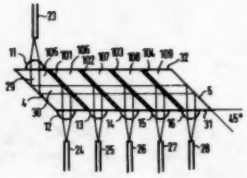
1. An arrangement for providing coupling of an optical signal between an input single mode fiber and an output single mode fiber, said arrangement comprising a separate section of multimode fiber of a predetermined length and comprising a first endface and a second endface, the first endface of said multimode fiber being fused to said input single mode fiber to provide coupling therebetween.

4,701,012

OPTICAL MULTIPLEXER/DEMULTIPLEXER

Manfred Kaiser, Hemmingen, Fed. Rep. of Germany, assignor to Standard Elektrik Lorenz, Stuttgart, Fed. Rep. of Germany

Filed Apr. 11, 1985, Ser. No. 722,572
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413703
Int. Cl.[4] G02B 6/34
U.S. Cl. 350—96.19 **14 Claims**



1. An optical multiplexer/demultiplexer comprising:

a plurality of optically transparent elements aligned along an optical axis;

a plurality of optical filter elements, each of said optical filter elements being selected for a differing wavelength of light and acting as a wavelength selective beam splitter for the selected wavelength of light associated therewith, each one of said plurality of optical filter elements being interposed between adjacent ones of said plurality of transparent elements to form a unitary optical structure wherein each of said plurality of optically transparent elements and each of said plurality of optical filter elements in said unitary structure is aligned along said optical axis to form an elongate unitary structure;

first input/output means for introducing/receiving multiple wavelength optical information to/from said elongate unitary structure, said first input/output means being disposed at an initial portion of said elongate unitary structure and positioned to introduce/receive multiple wavelength optical information to /from said elongate unitary structure in a direction transverse to said optical axis; and

a plurality of second output/input means for receiving/introducing selected single wavelength optical information from/to said elongate unitary structure, each of said plurality of second output/input means being disposed at a portion of said elongate unitary structure to receive/introduce selected wavelength optical information from/to an associated one of said plurality of optical filter elements and positioned to receive/introduce said selected wavelength optical information in a direction transverse to said optical axis.

4,701,013

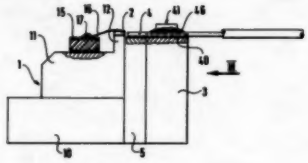
OPTICAL SOURCE WITH OPTICAL FIBER CARRIER

Michel Jurczyszyn, and Michel Marchand, both of Ivry sur Seine, France, assignors to Compagnie Industrielle des Telecommunications, Paris, France

Filed Nov. 13, 1985, Ser. No. 797,548
Claims priority, application France, Nov. 13, 1984, 84 17297
Int. Cl.[4] G02B 6/42
U.S. Cl. 350—96.20 **9 Claims**

1. Optical source comprising: a base, a light-emitting component mounted on said base, a fiber-carrier in the form of a slab fastened to said base, an optical fiber mounted on said fiber-car-

rier and having an end optically coupled to said light-emitting component and an intermediary part in the form of a narrow



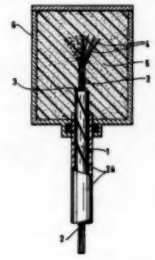
slab with plane surfaces fixed to said base on one side and spot soldered to said fiber-carrier on the other.

4,701,014

CONNECTION BETWEEN AN OPTICAL FIBER CABLE AND A JUNCTION BOX, AND A METHOD OF MAKING THE CONNECTION

Jean-Pierre Bonicel, Lyons, France, assignor to Les Cables de Lyon, Clichy, France

Filed Nov. 18, 1985, Ser. No. 799,662
Claims priority, application France, Nov. 16, 1984, 84 17532
Int. Cl.[4] H02B *6/36*
U.S. Cl. 350—96.20 **3 Claims**



1. In a connection between a junction box for an optical fiber cable and an axial strength member, said strength member constituted by one of braided fibers and a composite material including fibers, the improvement comprising the fibers of the axial strength member being splayed out at the end thereof into a tuft of fibers and a receptacle fixed to said box and a cold-polymerized resin filling a cavity in said receptacle about said tuft and embedding said tuft of fibers.

4,701,015

WATERPROOF OPTICAL FIBER CABLE AND METHOD OF THE PRODUCTION THEREOF

Yasunori Saito; Osamu Ichikawa, and Toshio Oshima, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 22, 1985, Ser. No. 714,858
Claims priority, application Japan, Mar. 29, 1984, 59-59571
Int. Cl.[4] G02B *6/44*
U.S. Cl. 350—96.23 **5 Claims**

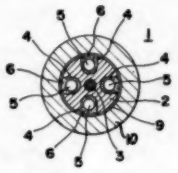
1. A waterproof optical fiber cable for use in a communication system comprising:

an elongated spacer formed with at least one groove extending therealong,

an optical fiber put in said groove in a slack state,

dampproof jelly material filled into a plurality of first portions of said groove to define first filled portions spaced from one another by a predetermined interval with respect to the longitudinal direction of the spacer,

dampproof powder material filled into second portions to define second filled portions between said first filled portions, and



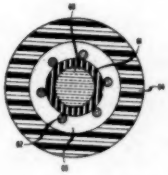
means for covering the outer surface of the first and second filled portions without forming any gap between the outer surface of the first filled portions and the covering means.

4,701,016

THIXOTROPIC GREASE COMPOSITION AND CABLE COMPRISING SAME

Charles H. Gartside, III, Lilburn; Alvin C. Levy, Atlanta; Bob J. Overton, and Carl R. Taylor, both of Lawrenceville, all of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 31, 1985, Ser. No. 697,054
Int. Cl.[4] G02B *6/44*; H01B *7/00*; H02G *15/00*; B01J *13/00*
U.S. Cl. 350—96.23 **11 Claims**



1. An article of manufacture comprising a filling material contained within a sheath, CHARACTERIZED IN THAT the filling material comprises

(a) 77 to 95% b.w. of oil, or mixture of oils, selected from the class consisting of

(i) ASTM type 103, 104A, or 104B paraffinic or naphthenic oil having a minimum specific gravity of about 0.86 and a pour point (ASTM D97) of less than −4° C.,

(ii) polybutene oil of minimum specific gravity of about 0.83 and a pour point (ASTM D97) of less than 18° C.,

(iii) triglyceride-based vehetable oil,

(iv) polypropylene oil,

(v) chlorinated paraffin oil having a chlorine content between about 30 and 75% b.w. and a viscosity at 25° C. of between 100 and 10,000 cps, and

(vi) polymerized esters;

(b) 2 to 15% b.w. colloidal particles selected from the class consisting of hydrophobic fumed silica, precipitated silica, and clay, the colloidal particles having a BET surface area in the range from about 50 to about 400 m^2/g;

the filling material having a critical yield stress of less than 140 Pa at 20° C.

4,701,017

TOUCH POSITION SENSITIVE OPTICAL WAVEGUIDES

Gust J. Kookootsedes; Herschel H. Reese, both of Midland; Beth I. Gutek, Freeland, and Gale H. Pretzer, Hemlock, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 3, 1986, Ser. No. 835,507
Int. Cl.[4] C08G *77/06*; G02B *6/12*
U.S. Cl. 350—96.34 **12 Claims**

1. A transparent touch position sensitive optical waveguide exhibiting a thickness of at least 2.5 mm and consisting essentially of a layer of cured, fracture resistant, resin reinforced polyorganosiloxane elastomer having two substantially parallel major surfaces, at least one of which is bonded to a dirt- and puncture resistant coating, where said elastomer exhibits a hardness of from 0, measured using the Shore 00 durometer scale, to a value of 10, measured using the Shore A durometer scale, and is the product of a hydrosilation reaction between the ingredients of a composition comprising:

A. at least one liquid polydiorganosiloxane exhibiting a viscosity of from 0.1 to 40 Pa.s at 25° C. and containing either a vinyl radical or a silicon-bonded hydrogen atom at each of the two terminal positions;

B. an amount of an organosiloxane crosslinking agent sufficient to produce said elastomer by a hydrosilation reaction between said crosslinking agent and the other ingredients of said composition;

C. from 5 to about 40 percent, based on the total weight of said composition, of a benzene soluble resinous copolymer comprising triorganosiloxy units of the general formula $R''_3SiO_{\frac{1}{2}}$, diorganovinylsiloxy units of the general formula $CH_2{=}CH(R''')_2SiO_{\frac{1}{2}}$, and SiO_2 units, where R'' and R''' are individually monovalent hydrocarbon or halohydrocarbon radicals containing from 1 to about 20 carbon atoms and free of ethylenic unsaturation, the molar ratio of combined triorganosiloxy units and diorganovinylsiloxy units to SiO_2 units is from 0.7 to 1.2 and said copolymer contains from 0.1 to 8 weight percent of silicon-bonded vinyl radicals; and

D. a platinum-containing hydrosilation catalyst in an amount sufficient to cure said composition to said elastomer;

where the molar ratio of silicon-bonded hydrogen atoms to vinyl radicals in said composition does not exceed 1:1, said coating is formed from a polymeric material selected from the group consisting of (a) polyurethanes derived from aromatic, aliphatic or cycolaliphatic diisocyanates and organic polyols, (b) polyorganosiloxane and (c) block copolymers comprising (1) repeating units of a polyurethane and (2) up to 50 mole percent, based on total repeating units in said block copolymer, of diorganosiloxane units; and where a coated surface of said waveguide resists fracturing under a force of 5 kilograms applied using a 1.6 cm.-diameter sphere the compressibility at any point on a coated surface of the waveguide is such that the force required to depress said surface a distance of 1 mm is no greater than 200 grams applied using a 1.6 cm.- diameter sphere, and the waveguide recovers at least 95% of its initial thickness within one second after being compressed up to 50% of its initial thickness for a period of up to one minute.

4,701,018

APPARATUS FOR MOUNTING TWO LASERS TO PRODUCE PARALLEL OR COLINEAR BEAMS

Bryan E. Loucks, Los Altos Hills, Calif., assignor to Greyhawk Systems, Inc., Milpitas, Calif.

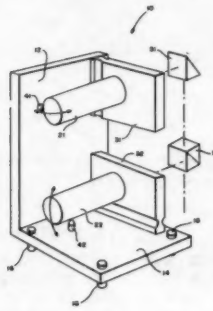
Filed Oct. 2, 1986, Ser. No. 914,642
Int. Cl.[4] G02B *27/10*
U.S. Cl. 350—174 **3 Claims**

1. An apparatus for mounting two lasers to produce controlled parallelism of the beams therefrom comprising

a frame having a first wall surface and a second wall surface which are perpendicular to each other,

a first plate for affixing a first laser thereon, said first plate being flexibly affixed to said first wall surface along an edge which is normal to said second wall surface,

a second plate for affixing a second laser thereon, said second plate being flexibly affixed to said second wall surface along an edge which is normal to said first wall surface,



a first adjusting screw adapted to move in the direction normal to said first wall surface and to thereby cause said first laser to move parallel to said second wall surface, and

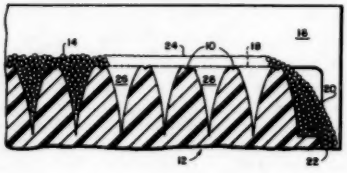
a second adjusting screw adapted to move in the direction normal to said second wall surface and to thereby cause said second laser to move parallel to said first wall surface.

4,701,019

SELECTIVE APPLICATION OF LIGHT-ABSORBING PARTICLES TO A LENTICULAR SCREEN

Brian J. Fitzpatrick, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,669
Int. Cl.[4] G03B *21/60*; B05D *5/06*
U.S. Cl. 350—127 **9 Claims**



1. In a light-transmissive screen having a surface contoured to include a multiplicity of raised lenticules having respective peaks and sidewalls, said sidewalls defining grooves between the lenticules, the improvement comprising a multiplicity of light-absorbing particles filling each groove to a predefined depth, said particles having a substantially higher microwave absorption coefficient than the screen material, and having heat-fusible outer surfaces which are microwave-fused to each other and to the screen, thereby affixing the particles in the grooves.

4. A method for selectively applying light-absorbing particles to a light-transmissive screen having a surface contoured to include a multiplicity of raised lenticules having respective peaks and sidewalls, said sidewalls defining grooves between the lenticules, said method comprising the steps of:

(a) filling the grooves to a predetermined depth with a slurry comprising a mixture of a volatile liquid and light-absorbing particles having a substantially higher microwave absorption coefficient than the screen material and having heat-fusible outer surfaces; and

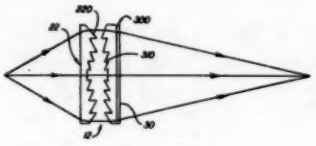
(b) transfusing the screen and the particles in the grooves with microwave radiation of sufficient energy to fuse the particles to each other and to the screen, but of insufficient energy to optically distort the screen.

4,701,020

REAR PROJECTION SCREEN WITH IMPROVED LUMINANCE UNIFORMITY

Ralph H. Bradley, Jr., Kingsport, Tenn., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Sep. 18, 1986, Ser. No. 910,046
Int. Cl.[4] G03B *21/60*
U.S. Cl. 350—128 **13 Claims**



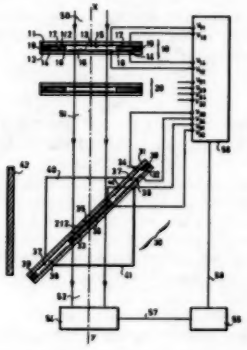
1. Color television rear projection screen having a circular Fresnel lens component with an infinite second conjugate, for collimating the light from a projected image, and a front vertically oriented lenticular lens array, for spreading the collimated light horizontally in an audience field; characterized by also having a horizontally oriented linear Fresnel lens component with a finite second conjugate, whereby the screen exhibits its improved luminance uniformity.

4,701,021

OPTICAL MODULATOR

Jean-Pierre Le Pesant, Gif sur Yvette; Michel Hareng, La Norville; Bruno Mourey, Boulogne Billancourt, and Jean-Noël Perbet, Gif sur Yvette, all of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 18, 1984, Ser. No. 662,156
Claims priority, application France, Oct. 21, 1983, 83 16794
Int. Cl.[4] G02B *26/02*
U.S. Cl. 350—267 **13 Claims**



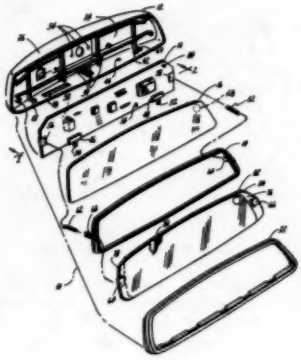
1. An optical modulator of a light beam comprising:
a plurality of cells each of which comprise:
two transparent plates separated one from the other;
spacing means for holding said transparent plates apart;
capillary space between said two transparent plates;
reservoir means located between said two transparent plates for containing at least one fluid;
electrical field producing means for applying an electrical field between said transparent plates for controlling the displacement of the fluid contained in said reservoir means between said reservoir means and said capillary space, wherein said fluid will be located in said reservoir means in response to the presence of said electrical field;
measuring means for measuring the intensity of a light beam and for outputting a signal indicative of the measured light;
control means coupled to said measuring means and the electrical field producing means of each of said cells for providing control information for activation of said electrical field producing means in response to said signal indications of said measured light;
wherein at least one of said cells is positioned in such a manner such that the capillary space is perpendicular to the direction of said light beam.

4,701,022

DAY/NIGHT MIRROR

Keith D. Jacob, Ann Arbor, Mich., assignor to C-D Marketing, Ltd., Ann Arbor, Mich.

Filed Nov. 28, 1984, Ser. No. 675,487
Int. Cl.[4] G02B *17/00*
U.S. Cl. 350—278 **25 Claims**



1. In a day/night rearview mirror assembly having a mirrored surface in association with a voltage-controlled optical medium wherein the medium controls the brightness of the field of view reflected by the mirrored surface in accordance with voltage applied to the medium and a control circuit for applying control voltage to the medium including a sensor for sensing incident light from the field of view to distinguish between a field of view which is bright and one which is dim and a second sensor for sensing general ambient light in the vicinity of the mirror assembly to distinguish between daytime conditions and nighttime conditions, the improvement which comprises said control circuit comprising means for operating said mirror assembly to two different states of brightness, one higher and the other lower, comprising a logic gate having an output and plural inputs, means operatively coupling the logic gate output with the optical medium such that the logic gate output causes control voltage to be selectively applied to said medium to thereby selectively operate the mirror assembly to the two different states of brightness in accordance with a control provided by said logic gate, plural input circuits each of which has an output connected to a corresponding one of the inputs of said logic gate, one of said input circuits containing the first-mentioned sensor and another of said input circuits

containing the second sensor, each input circuit comprising its own timing means for imposing a certain predetermined minimum time requirement on certain change sensed by the corresponding sensor before the effect of such change is allowed to occur at the output of the corresponding input circuit, the timing means of said second input circuit imposing a minimum time requirement on both a change in sensed ambient light indicative of transition from day to night as well as a change in sensed ambient light indicative of transition from night to day, and the timing means of said first input circuit imposing a minimum time requirement only on a change in sensed light from the field of view indicative of a transition from bright to dim and not on a change indicative of a transition from dim to bright.

4,701,023

OPTICAL ARRANGEMENT FOR TRANSMITTING HIGH-INTENSITY RADIATION

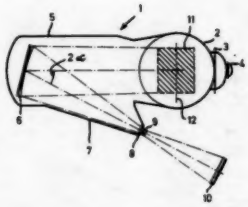
Karl-Heinz Hager, Heidenheim-Schnaitheim; Peter Henneberg, Aalen, and Hans-Joachim Juranek, Aalen-Waldhausen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Oct. 11, 1985, Ser. No. 786,660

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1984, 3437271

Int. Cl.[4] G02B *7/00, 27/00;* F21Q *7/00*

U.S. Cl. 350—321 **5 Claims**



1. A sun simulator for simulating conditions in outer space comprising:

a housing defining a test chamber; and,

an optical arrangement for transmitting high-intensity radiation into a circular test plane of predetermined dimensions located in said test chamber, the optical arrangement including:

radiation source means for supplying the high-intensity radiation;

an integrator assembly for transmitting the radiation supplied by said source means along a first beam path with a predetermined cross section;

a collimator mirror mounted in said housing and being a distance (T) from the test plane and a distance (P) from said integrator assembly and having a curved reflecting surface defining a predetermined radius of curvature (r) for reflecting said radiation along a second beam path onto the test plane in the form of a beam of radiation having a distortion which is dependent upon: the angle of incidence (α) of said radiation on said mirror; said radius of curvature (r); said distance (P); and, said distance (T);

said first beam path and said second beam path conjointly defining a common plane and said test plane being perpendicular to both said common plane and said second beam path;

said integrator assembly being mounted outside of said housing and including a plurality of field lenses arrayed one next to the other, each of said lenses having an elliptical outer periphery selected to compensate for said distortion so as to impart a cross section to the beam of radiation reflected by said mirror means that conforms substantially to said predetermined dimensions of said circular test plane thereby substantially preventing the occurrence of unwanted radiation outside of the test plane.

4,701,024

LIQUID CRYSTAL MATERIAL INCLUDING MAGNETIC PARTICLES AND METHOD OF PRODUCING THE SAME

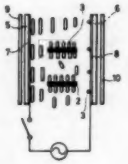
Shunsuke Kobayashi; Yoshihiko Matsuyama, and Masayoshi Koutake, all of Kawaguchi, Japan, assignors to Dai-ichi Seiko Kabushiki Kaisha, Kawaguchi, Japan

Filed Dec. 1, 1986, Ser. No. 936,180

Claims priority, application Japan, Dec. 2, 1985, 60-272166; Apr. 25, 1986, 61-97382

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—331 R **12 Claims**



1. A liquid crystal material comprising a liquid crystal substance to be used to form a liquid crystal display device and many needle-shaped magnetic substance particles dispersed in said liquid crystal substance and coated respectively with a surface active agent.

8. A method of producing a liquid crystal material comprising a first step of preparing many needle-shaped magnetic substance particles, a second step of treating said respective magnetic substance particles on the surfaces with a surface active agent to orient the molecules of a liquid crystal substance so that their long axes may be vertical to the surfaces of said magnetic substance crystals, to prevent said magnetic substance particles from cohering and to uniformly and stably disperse said magnetic substance particles in the liquid crystal substance to be used to form a liquid crystal display device, a third step of dispersing many needle-shaped magnetic substance particles obtained by said second step in a solvent affinable with said liquid crystal substance, a fourth step of mixing the resulant obtained by the third step into said liquid crystal substance and a fifth step of volatilizing and removing said solvent from the mixture obtained by the fourth step to uniformly and stably mix and retain said magnetic substance particles in said liquid crystal substance.

4,701,025

LIQUID CRYSTAL DISPLAY DEVICE WITH DRIVING METHOD TO ELIMINATE BLUR DUE TO FREQUENCY DEPENDENCE

Shyusuke Endo; Naofumi Aoyama; Toshihiko Yabuuchi, all of Mobara; Toshiyuki Sakuma, Isumi, and Kiyoshige Kinugawa, Chosei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1985, Ser. No. 766,944

Claims priority, application Japan, Aug. 20, 1984, 59-171627

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—333 **4 Claims**

1. A liquid crystal display device comprising:

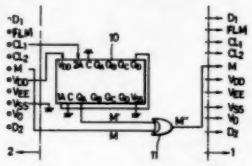
a liquid crystal module including a liquid crystal display panel having a plurality of liquid crystal picture elements arranged in a matrix form, and driving circuits for applying driving signals to signal electrodes and to scanning electrodes of the liquid crystal display panel, respectively;

a control circuit for controlling the operation of the liquid crystal module;

first means for dividing frequency of a timing signal given by

the control circuit and producing a first signal of lower frequency; and

second means for inverting the first signal of lower frequency once per frame period and generating a second signal to reverse the polarity of voltages applied to liquid crystal display elements with frequency higher than the frame frequency.



4,701,026

METHOD AND CIRCUITS FOR DRIVING A LIQUID CRYSTAL DISPLAY DEVICE

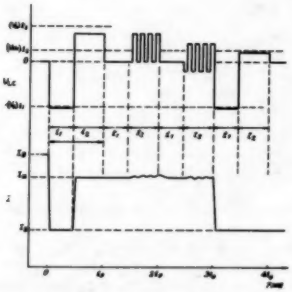
Minoru Yazaki, and Yuzuru Sato, both of Suwa, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1985, Ser. No. 743,531

Claims priority, application Japan, Jun. 11, 1984, 59-119680; Aug. 27, 1984, 59-177818

Int. Cl.[4] G02F 1/13

U.S. Cl. 350—333 **23 Claims**



19. A circuit for driving a multielement liquid crystal display having a first electrode and a second electrode and a crystal layer including a ferroelectric liquid crystal disposed between said first electrode and said second electrode, said first electrode, and said second electrode being for applying a driving electric field to said liquid crystal layer, the circuit comprising:

a first generating means for producing first pulses to be supplied to said first electrode;

a second generating means for generating second pulses to be applied to said second electrode;

said first pulses and said second pulses being combined across said liquid crystal layer to produce at least one selecting electric field pulse, during a selecting term, having an amplitude and a period which exceeds a threshold value of optical response of said ferroelectric liquid crystal layer; and at least one non-selecting electric field pulse, during a non-selecting term, having an amplitude and period which combined are less than the threshold value.

4,701,027

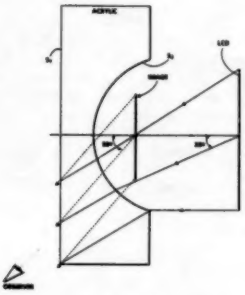
DISPLAY DEVICE WITH INCREASED VIEW ANGLE

Michael E. Harrigan; John A. Durbin, both of Webster, and Ross E. Schroll, East Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 17, 1986, Ser. No. 931,486

Int. Cl.[4] G02F 1/13

U.S. Cl. 350—334 **3 Claims**



1. An image bar display comprising:

a display panel disposed in a viewing plane;

means for providing a light output at said display panel; and

an optical device placed adjacent the display side of said panel, said optical device adapted to increase the view angle of the displayed image by decreasing the size of the displayed image in at least one direction.

4,701,028

LIQUID CRYSTAL CELL WHICH CAN HAVE A HOMEOTROPIC STRUCTURE WITH COMPENSATED BIREFRINGENCE OF SAID STRUCTURE

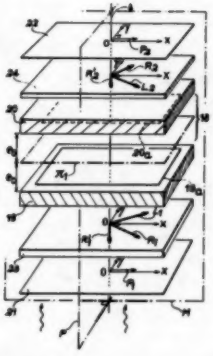
Jean-Frédéric Clerc, Meylan, and Jean-Claude Deutsch, Grenoble, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 16, 1985, Ser. No. 734,484

Claims priority, application France, May 18, 1984, 84 07767

Int. Cl.[4] G02F 1/13

U.S. Cl. 350—337 **10 Claims**



1. A liquid crystal cell of the electrically controlled birefringence type, comprising an assembly having a liquid crystal layer which can have a homeotropic structure and electrodes located on either side of the layer and whereof at least one is

transparent, wherein one of the sides of said assembly is exposed to an incident light, wherein the cell also comprises, at least on said side, a means for polarizing the incident light, and wherein the thickness of the layer and each polarization means are intended to bring about a compensation of the birefringence of the liquid crystal layer in its homeotropic structure so that the cell has a high contrast for said structure in the case of an oblique observation performed in a given observation plane.

4,701,029

LASER ADDRESSED SMECTIC DISPLAYS

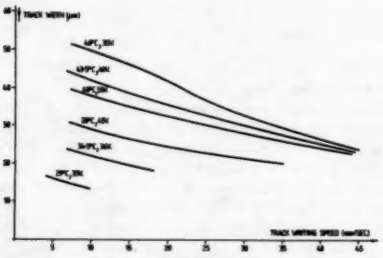
William A. Crossland; Christopher J. J. Walker, both of Harlow, and Anthony B. Davey, Bishops Stortford, all of England, assignors to Standard Telephones and Cables Public Limited Company, London, England

Filed Jul. 10, 1985, Ser. No. 753,444

Claims priority, application United Kingdom, Jul. 17, 1984, 8418120

Int. Cl.[4] G02F *1/137*

U.S. Cl. 350—351 **2 Claims**



1. A method of operating a laser beam scanned smectic cell to produce scattering texture data set against a substantially non-scattering clear background, wherein an entire area of the liquid crystal layer of the cell is 'erased' by setting it into a scattering state, and wherein data is subsequently entered on the erased area by the creation of substantially non-scattering clear regions produced by scanning the laser beam across selected portions of the erased area to produce localised heating into the isotropic phase by absorption of the laser light by a guest dye followed by rapid cooling characterised in that the setting into a scattering state is achieved by temporarily inducing dynamic scattering, and in that the rapid cooling is in the presence of an alternating electric field applied across the thickness of the layer that is too high in frequency to produce dynamic scattering and is insufficient in amplitude to switch regions of the area not subject to the laser beam induced thermal excursion.

4,701,030

THERMAL STABLE OPTICAL LOGIC ELEMENT

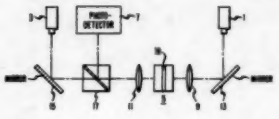
Jack L. Jewell, Bridgewater, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 15, 1985, Ser. No. 712,212

Int. Cl.[4] G02F *1/01, 1/015, 1/17*

U.S. Cl. 350—354 **10 Claims**

1. An optical device comprising:
an optical nonlinear element;
means for making a probe beam incident on said element;
means for making at least one input beam incident on said element; and
means for detecting the output from said element;
said element being such that, in the presence of said at least one input beam, a lesser amount of the energy of said probe beam is absorbed by said element as compared with energy of probe beam absorbed in the absence of said at least one input beam,



whereby heat dissipated by said element is at least approximately constant during device operation.

4,701,031

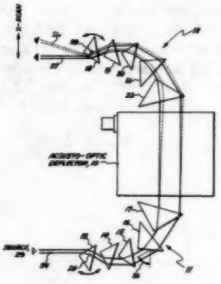
PRISM TELESCOPE TO MATCH OPTICAL REQUIREMENTS FOR ACOUSTO-OPTIC DEFLECTOR

Carl M. Penney, Schenectady, N.Y., and Bradley S. Thomas, Altamonte Springs, Fla., assignors to General Electric Company, Schenectady, N.Y.

Filed May 29, 1986, Ser. No. 868,379

Int. Cl.[4] G02F *1/11*

U.S. Cl. 350—371 **14 Claims**



1. A light beam deflection system comprising:
an acousto-optic deflector which has an active region and deflects an incident beam of light through a range of angles;
a light source providing a substantially symmetrical input beam;
incident prism telescope means comprised of a train of optical prisms to expand said input beam along one dimension to fill said active region and maximize deflector resolution while redirecting the expanded beam through 90°; and
exit prism telescope means comprised of a second train of optical prisms to reduce the beam size while multiplying the angle of deflection and redirecting the reduced beam through an additional 90° such that the output beam is folded through 180° and is scanned along one axis.

4,701,032

GRADED REFRACTIVE INDEX LENS SYSTEM

Katsuhiro Takada, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,177

Claims priority, application Japan, Oct. 25, 1984, 59-224869; Jan. 16, 1985, 60-3998; Jan. 16, 1985, 60-3999; Jan. 16, 1985, 60-4000; Jan. 16, 1985, 60-4001

Int. Cl.[4] G02B *3/02, 13/18*

U.S. Cl. 350—413 **70 Claims**

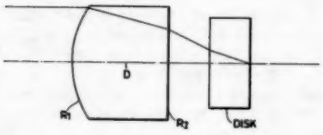
1. A graded refractive index single lens system comprising at least one surface formed spherically, having refractive index n expressed by the formula shown below wherein n_0 represents the refractive index on the optical axis of said lens and r repre-

sent the radial distance from the optical axis, and satisfying the conditions (1), (2) and (3) shown below:

$$n^2 = n_0^2[1-(gr)^2+h_4(gr)^4+h_6(gr)^6+\ldots]$$

$$gD<0.51 \quad (1)$$

$$0.3<g\phi<0.7 \quad (2)$$



$$0.28f<D \quad (3)$$

where g is a parameter representing the degree of the gradient of the refractive index distribution, h_4 and h_6 respectively represent the 4th- and 6th-order coefficients of said refractive index distribution, D represents the length of said lens, ϕ represents the diameter of said lens and f represents the focal length of said lens.

4,701,033

VARIABLE FOCAL LENGTH LENS SYSTEM

Hisayuki Masumoto, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

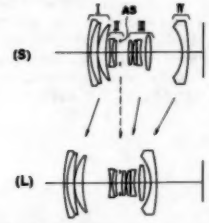
Filed Sep. 6, 1984, Ser. No. 648,019

Claims priority, application Japan, Sep. 9, 1983, 58-167319; Aug. 17, 1984, 59-172306

The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.

Int. Cl.[4] G02B *15/15*

U.S. Cl. 350—425 **22 Claims**



1. A variable focal length lens system comprising from object side to image side:

a first lens unit of a positive refractive power;

a second lens untin of a negative refractive power with a first variable air space formed between the first and second lens units;

a third lens unit of a positive refractive power; and

a fourth lens unit of a negative refractive power with a second variable air space formed between the third lens unit and fourth lens unit;

wherein the back focal length of the whole lens system for the shortest focal length is less than half of the diagonal length of the image plane;

wherein the first lens unit is shiftable from the image side to the object side while increasing the first variable air space in the zooming operation from the shortest focal length to the longest focal length; and

wherein the fourth lens unit is shiftable from the image side to the object side while decreasing the second variable air space in the zooming operation from the shortest focal length to the longest focal length.

4,701,034

LARGE APERTURE ZOOM LENS SYSTEM

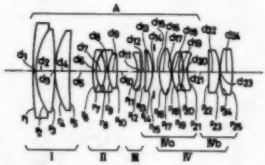
Shin-ichi Mihara, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1985, Ser. No. 706,863

Claims priority, application Japan, Mar. 2, 1984, 59-38649; Mar. 2, 1984, 59-38650; Mar. 7, 1984, 59-41974

Int. Cl.[4] G02B *9/64, 15/14*

U.S. Cl. 350—427 **19 Claims**



1. A large-aperture zoom lens system comprising a varifocal subsystem comprising a first lens unit having a positive focal length and being immovable for varying focal length of said zoom lens system as a whole, a second variator lens unit having a negative focal length and being movable for varying focal length of the zoom lens system as a whole, and a third compensator lens unit having a negative focal length and functioning mainly for compensating variation of the image position caused by the variation of the focal length of said zoom lens system as a whole, and a relay lens system arranged as a fourth lens unit, said fourth lens unit consisting of a front subunit comprising a positive lens component, a positive lens component, a biconcave lens component and a positive lens component in the order from object side, and a rear subunit comprising two positive lens components.

4,701,035

REFLECTION OPTICAL SYSTEM

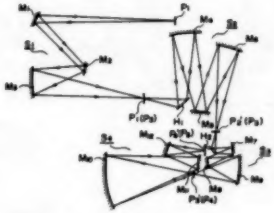
Ryusho Hirose, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1985, Ser. No. 764,001

Claims priority, application Japan, Aug. 14, 1984, 59-169639; Aug. 14, 1984, 59-169640; Aug. 14, 1984, 59-169641; Aug. 14, 1984, 59-169642; Nov. 20, 1984, 59-246533

Int. Cl.[4] G02B *17/06*

U.S. Cl. 350—505 **7 Claims**



1. An off axis imaging reflection optical system, comprising:

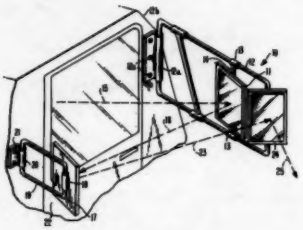
a first component mirror system including a plurality of mirror elements and being effective to form an image at an enlarged magnification;

a second component mirror system including a plurality of mirror elements and being effective to form an image at a reduced magnification;

wherein said first and second component mirror systems are arranged to form an image of an object at a reduced over-

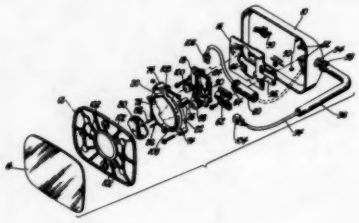
all magnification, and wherein at least one of said mirror elements has its working surface off a common optical axis of other mirror elements.

4,701,036
TRIPLE VIEW MIRROR SYSTEM
R. H. Bowers, 1869 Wanninger La., Cincinnati, Ohio 45230
Filed Apr. 7, 1986, Ser. No. 849,010
Int. Cl.[4] G02B *5/08*; B60R *1/10*
U.S. Cl. 350—622 **1 Claim**



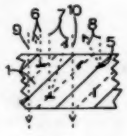
1. A vehicle cab rear view mirror assembly comprised of a first frame mounted on an exterior forward side portion of the vehicle cab, a first mirror adjustably mounted on said first frame, a second frame mounted on an exterior rear portion of the vehicle cab, a second mirror adjustably mounted on said second frame, and a third mirror adjustably mounted on said first frame adjacent said first mirror, whereby with said second mirror facing the first and third mirrors a rearward view may be consecutively reflected by said third mirror, said second mirror, and said first mirror respectively for viewing by an occupant of the vehicle cab.

4,701,037
REMOTE CONTROL REAR VIEW MIRROR, ELECTRICALLY OPERATED
Charles Bramer, Norton Shores, Mich., assignor to Lacks Industries, Inc., Grand Rapids, Mich.
Filed Feb. 13, 1986, Ser. No. 829,010
Int. Cl.[4] B60R *1/06*; G02B *7/18*
U.S. Cl. 350—634 **1 Claim**



1. A remote control rear view mirror, comprising:
a housing having a mirror receptive opening provided therein and a mounting plate that is received therein and is adapted to be fastened to the inner back wall thereof,
a drive motor unit including two separate electrical motors provided on said mounting plate and having means providing a connection to a source of electrical power,
a mirror glass supporting frame member having a ball-and-socket connection with said drive motor unit and a drive connection with each of said electrical motors,
a retainer ring adapted to be mounted and supported on said mounting plate and to have pivotal support and restrictive engagement with said frame member,
said frame member having a rearwardly projected back wall part and said retainer ring including two complementary parts adapted for fitted engagement with said frame member back wall part,
said back wall part and said retainer ring parts being formed for spherical surfaced pivotal engagement therebetween and with the same axial center as said ball-and-socket connection,
means provided within said ball-and-socket connection and between said back wall and retainer ring parts for restricting and limiting the pivotal movement otherwise afforded thereto and therebetween,
said means including a couple of locating pins on said back wall part for complementary engagement with slots in said retainer ring parts,
a disc-like member provided on the back wall of said frame member centrally within said rearwardly projecting back wall part and being formed to provide the ball head part of said ball-and-socket connection and with a pair of relatively transversely spaced and flexible screw threaded members extending outwardly therefrom,
said disc-like member being provided with tabs extending from the circumference thereof for alignment of said member with recesses in said back wall part,
said drive motor unit having the socket joint of said ball-and-socket connecting provided thereon and having the electric motors thereof inclusive of worm gear drive operatively engaged with said screw threaded members on the back wall of said mirror supporting frame member part for providing the drive connection therebetween.

4,701,038
COSMETIC CONTACT LENS
Charles W. Neefe, Big Spring, Tex., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Continuation-in-part of Ser. No. 497,799, May 25, 1983, abandoned, which is a continuation-in-part of Ser. No. 463,541, Mar. 14, 1983, Pat. No. 4,460,523. This application Dec. 17, 1984, Ser. No. 682,698
The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.
Int. Cl.[4] G02C *7/04*; A61K *9/00*
U.S. Cl. 351—162 **16 Claims**



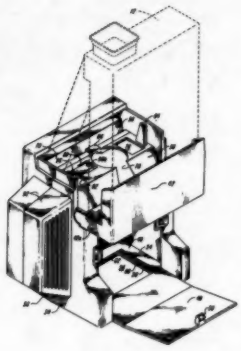
13. A contact lens which changes the apparent color of the eye upon which it is worn, comprising a transparent central pupil area surrounded by a semi-transparent area, said latter area comprising a transparent colored material having light reflecting particles evenly distributed therein.

4,701,039
COPY ACCESSORY FOR INSTANT CAMERA
Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Nov. 1, 1985, Ser. No. 793,985
Int. Cl.[4] G03B *15/03, 17/50, 27/54*
U.S. Cl. 354—80 **16 Claims**

1. An accessory for use with a camera having a taking lens

and a source of artificial illumination, said accessory comprising:

a housing including means for positioning an article to be photographed and means for mounting the camera with its taking lens operably disposed with respect to such an article; and



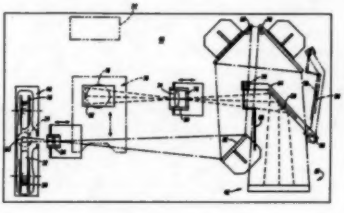
optical means for receiving light from the camera's source of artificial illumination and redirecting such light onto the article so that the article is substantially uniformly illuminated during the camera's exposure sequence, said optical means including a pair of mirrors arranged to direct the artificial illumination at relatively shallow angles to the article from opposite sides thereof so as to evenly illuminate the article and to eliminate specular reflection.

4,701,040

IDENTIFICATION CARD CAMERA SYSTEM HAVING IMPROVED CARD CLASSIFYING APPARATUS

Douglas E. Miller, Oakdale, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 30, 1986, Ser. No. 869,183
Int. Cl.[4] G03B *17/24*
U.S. Cl. 354—109 **9 Claims**



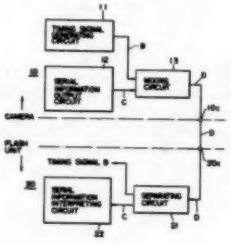
1. In a photographic identification camera for producing identification documents, said camera having a housing assembly defining a compartment which can removably receive therein a data document to be used for production of the identification document, the improvement comprising: means for selectively identifying different categories of identification documents, said means including a plurality of markers rotatably movable internally of the compartment to an operative condition which overlies a portion of the data document subsequent to its receipt within the compartment and each corresponding to a predetermined category of document so as to identify a different category of data document and, means operable for selectively positioning each of said markers to the operative condition so that respective ones of said markers can be recorded along with the data document.

4,701,041

FLASH PHOTOGRAPHING SYSTEM

Yoshio Serikawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 31, 1986, Ser. No. 925,602
Claims priority, application Japan, Oct. 31, 1985, 60-242804
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—413 **10 Claims**



1. A flash photographing system comprising:

a camera unit including mixing means for mixing a timing signal with a camera side information signal to produce a composite timing signal;

a flash unit including interpreting means for interpreting said camera side information signal;

first means for transmitting a first signal from said camera unit to said flash unit;

second means for transmitting a second signal from said flash unit to said camera unit; and

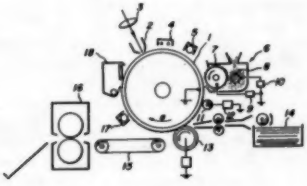
third means for transmitting said composite signal from said camera unit to said flash unit.

4,701,042

DUPLICATING APPARATUS

Yoshiyuki Mimura, and Yasuo Isono, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1985, Ser. No. 803,150
Claims priority, application Japan, Dec. 3, 1984, 59-255207
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD **17 Claims**



1. A duplicating apparatus comprising:

a rotatably mounted charge retentive member;

forming means for forming an electrostatic latent image on the charge retentive member;

developing means for developing the electrostatic latent image with toner particles of a dry developer to form a toner image;

correction means comprising a correction electrode arranged opposite to the charge retentive member with a predetermined gap therebetween and an AC bias voltage source connected to the correction electrode to form a vibrating electric field in the gap between the charge

retentive member and the correction electrode, for redistributing the toner particles within the image by alternate attraction and repulsion of the toner particles by the correction electrode responsive to said toner image being passed through said vibrating electric field;

and means for transferring onto a image receiving member the toner image that has been passed through the vibrating electric field.

4,701,043

IMAGE FORMING APPARATUS

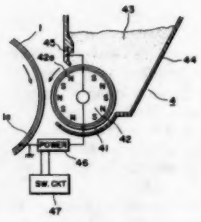
Kenzo Takayama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,762

Claims priority, application Japan, May 31, 1983, 58-96384

Int. Cl.[4] G03G *15/09*

U.S. Cl. 355—3 DD **3 Claims**



1. An image forming apparatus selectively operable in either a first mode in which an original is to be copied or a second mode in which an information signal is to be recorded, said apparatus comprising:

a movable electrophotographic type photosensitive member;

first means for forming an electrostatic latent image corresponding to said original, on said photosensitive member, said first means being operable in the first mode;

second means for forming an electrostatic latent image corresponding to the information signal, on said photosensitive member, said second means being operable in the second mode;

means for developing latent images, said developing means including a development electrode opposed to said photosensitive member and means for applying a development alternating bias voltage to said development electrode, and

means for changing a characteristic of development in said developing means in accordance with the selected mode, said changing means setting the development characteristic in said developing means to a first characteristic in the first mode and to a second characteristic in the second mode, wherein said first characteristic provides a V−D curve having a relatively gentle slope while said second characteristic provides a V−D curve having a relatively steep slope, wherein V is a surface potential of said photosensitive member and D is a density of the developed image;

wherein said changing means is adapted to set the frequency and the amplitude of said alternating bias voltage at relatively low levels in the first mode and at relatively high levels in the second mode, respectively.

4,701,044

IMAGE RECORDING APPARATUS FOR COMPOSING PLURAL PARTIAL ORIGINAL IMAGES INTO A SINGLE COMPOSITE IMAGE

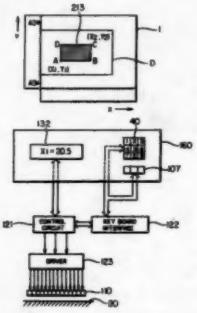
Tatsumi Horiuchi, Hino; Seitaro Kasahara, and Akira Sawaki, both of Hachioji, all of Japan, assignors to Konishiroku Photo Ind. Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1986, Ser. No. 821,452

Claims priority, application Japan, Jan. 29, 1985, 60-16308; Jan. 29, 1985, 60-16311; Jan. 29, 1985, 60-16314; Apr. 4, 1985, 60-72219

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—7 **20 Claims**



1. An image recording apparatus for composing plural partial orginal images into a single composite image, comprising:

a photoreceptor;

charging means for charging said photoreceptor;

first exposing means for forming an orginal image on the charged photoreceptor, thereby obtaining an image forming area;

second exposing means for neutralizing an area of the charged photoreceptor, thereby obtaining an image eliminating area corresponding to a neutralized area of the photoreceptor;

area control means for controlling said second exposing means in accordance with a boundary input defining a boundary between the image forming area and the image eliminating area;

recording means for recording a partial image obtained from the image forming area;

operating means for operating said charging means, said first and second exposing means, said area control means and said recording means at least two times to carry out at least first and second composing operations in accordance with the boundary input, said operating means including:

(a) means for carrying out said first composing operation such that a first image forming area and a first image eliminating area are formed on the charged photoreceptor and then a first partial image is recorded; and

(b) means for carrying out said second composing operation such that said second exposing means is controlled in the reverse mode relative to the first composing operation, whereby a second image forming area is formed on the area corresponding to the first image eliminating area, a second image eliminating area is formed on the area corresponding to the first image forming area and then a second partial image is so recorded as to be composed with said first partial image; and

said second exposing means including means for shifting at least either one of said first boundary between the first image forming area and the first image eliminating area or the second boundary between the second image forming area and the second image eliminating area from the input-

ted boundary, thereby avoiding an overlap image across the first partial image and the second partial image.

4,701,045

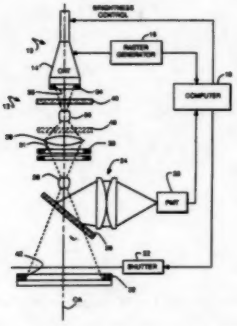
METHOD AND APPARATUS FOR REDUCING OPTICAL ARTIFACTS

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 27, 1986, Ser. No. 822,852

Int. Cl.[4] G03B *27/72*

U.S. Cl. 355—20 **11 Claims**



1. A process for projecting an image of an image-bearing material onto image recording material comprising the steps of:

projecting an image of the image-bearing material onto the image-recording material said projecting step includes illuminating the image-bearing material with preselected areas of illumination; and,

altering the energy distribution of the illuminating areas, said altering step including diffusing generally all the illumination of the preselected areas to an extent and in a manner so that the marginal edges of the areas of illumination blur gradually so as to minimize the visual effects of artifacts on the image recording material such that they are visually unobjectionable.

4,701,046

METHOD OF PHOTOGRAPHING ON MICROFILM AND APPARATUS THEREFOR

Koji Shiga, 26-30, 2-chome, Nishi-Azabu, Minato-ku, Tokyo, Japan

Filed Dec. 19, 1985, Ser. No. 810,712

Claims priority, application Japan, Dec. 19, 1984, 59-268101; Dec. 19, 1984, 59-268102

Int. Cl.[4] G03B *27/32, 27/52*

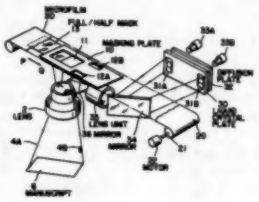
U.S. Cl. 355—39 **7 Claims**

1. An apparatus for photographing images with a camera from the manuscript placed on a table, which comprises:

an additional information generator which comprises a liquid crystal plate and two light sources provided behind said liquid crystal plate and a driving means for driving said liquid crystal plate so as to thereby optically generate additional information;

an optical path controlling means which comprises a first mirror which receives said additional information, a lens which focuses light reflected from said first mirror and a second mirror which reflects light transmitted from said lens into a microfilm so as to thereby focus said additional information and photograph said additional information on said microfilm; and

mask plates which are placed betwen said microfilm and said optical path controlling means so as to thereby selectively



expose said additional information alone at a predetermined position on said microfilm.

4,701,047

LINE SELECTION FOR PREPARING RANGE IMAGES

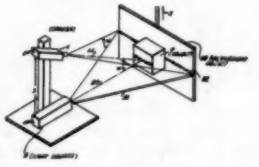
Max Eibert, Friedrichshafen; Peter Lux, Langenargen, and Walter Metzdorf, Friedrichshafen, all of Fed. Rep. of Germany, assignors to Dornier GmbH, Friedrichshafen, Fed. Rep. of Germany

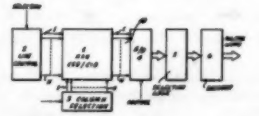
Filed Jun. 14, 1985, Ser. No. 745,405

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3423135

Int. Cl.[4] G01C *3/00*; G01B *11/24*

U.S. Cl. 356—1 **10 Claims**





1. A method of selecting an image line pursuant to the acquisition and formation of range images, comprising the steps of illuminating an object field by means of a light strip;

observing the object field by means of an imaging device, whereby optical axes of the light strip and of the imaging device have a particular angle in a plane transverse to a long extension of the light strip, for purposes of obtaining triangulation;

operating the imaging device so as to scan the image field column by column parallel to said plane and reading the content of a column, covering all image lines, in parallel;

digitizing the content of each column as read;

selecting in accordance with a selection logic a particular imaging dot within each of the columns as digitized; and

identifying the line position of that dot in vertical direction by a multibit binary data word in vertical direction in representation of the distance from the camera or the light strip source.

4,701,048

INPUT CIRCUIT FOR DISTANCE MEASURING APPARATUS

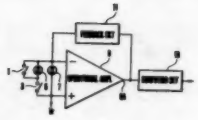
Ryuji Tokuda; Yoshihiro Harunari, both of Tokyo, and Takashi Kobe, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,958

Claims priority, application Japan, Feb. 23, 1983, 58-29076; May 16, 1983, 58-85500

Int. Cl.⁴ G01C *3/00, 5/00;* G03B *3/00*

U.S. Cl. 356—1 **32 Claims**



1. A signal processing device for a distance measuring apparatus having a light receiving portion in which a ratio of output current of first and second output portions varies in correspondence to a position of a received signal light, in which the signal light is projected and a reflection light thereof is received by the light receiving portion to detect the ratio of the output currents of the first and second output portions thereby judging the position of the received reflection light and the distance of an object is measured on the basis of the reflection light receiving position, and said processing device comprising:

(A) first and second light receiving means contstituting the light receiving portion for receiving the reflection light, said first and second light receiving means each outputting a current in correspondence to the amount of the reflection light received thereby, and the ratio of the output currents from said first and second light receiving means changing in correspondence to the receiving position of the reflection light;

(B) signal forming means for forming a signal in correspondence to the output currents from the first and second light receiving means;

(C) control means for controlling the inputting of the output current from the first light receiving means to the signal forming means; and

(D) current path forming means for forming a current path around said first light receiving means to liberate a current leakage from the first light receiving means thereby preventing said current leakage from being inputted to the signal forming means when said control means cuts off the inputting of the output current from the first light receiving means to the signal forming means.

4,701,049

MEASURING SYSTEM EMPLOYING A MEASURING METHOD BASED ON THE TRIANGULATION PRINCIPLE FOR THE NON-CONTACT MEASUREMENT OF A DISTANCE FROM THE SURFACE OF A CONTOURED OBJECT TO A REFERENCE LEVEL.

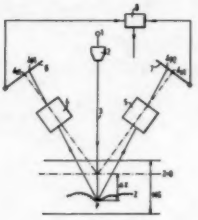
Leo H. J. F. Beckmann, Delft, and Gysbert L. Oomen, Pijnacker, both of Netherlands, assignors to B.V. Optische Industrie "De Oude Delft", Netherlands

Filed Jun. 19, 1984, Ser. No. 622,546

Claims priority, application Netherlands, Jun. 22, 1983, 8302228

Int. Cl.⁴ G01C *3/08*

U.S. Cl. 356—1 **8 Claims**



1. A measuring system for determining the distance between a reference level and a spot on the surface area of an object when said spot is within a measuring range extending from said reference level, by utilizing principle of triangulation, said system comprising: light source means for producing measuring radiation; optical collecting means optically coupled to said light source means for producing a beam of measuring radiation extending through said measuring range and towards an object spot under examination, reflected light image receiving means for receiving light radiation reflected from an object surface spot irradiated by said beam, and including receiving lens means for collecting radiation reflected from said object surface spot, and a radiation-sensitive detector optically coupled to said receiving lens means for receiving light radiation collected thereby and for converting the light radiation thus received into a corresponding signal; said detector having a substantially linear radiation-sensitive area; said receiving lens means being dimensioned and disposed relative to said beam and said detector as to image only those object surface spots irradiated by said beam within said measuring range, onto said linear radiation-sensitive area of said detector as focussed spots; said optical collecting means optically coupled to said light source means including further lens means adapted to cause the cross-sectional area of said beam to gradually increase from said reference level and with increasing distance therefrom, thereby causing said focussed spots on said detector to be of substantially one and same size.

4,701,050

SEMICONDUCTOR EXPOSURE APPARATUS AND ALIGNMENT METHOD THEREFOR

Yoshitada Oshida, Fugisawa; Masataka Shiba, Yokohama; Naoto Nakashima, Yokohama; Toshihiko Nakata, Yokohama, and Sachio Uto, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1985, Ser. No. 702,329

Claims priority, application Japan, Aug. 10, 1984, 59-166597; Aug. 31, 1984, 59-180531; Sep. 21, 1984, 59-196645

Int. Cl.⁴ G01B *11/26;* G01C *1/00*

U.S. Cl. 356—152 **12 Claims**

1. A semiconductor exposure apparatus comprising:

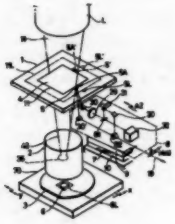
a mask;

an exposure light source for illuminating a pattern on said mask;

a focusing lens for focusing the pattern of said mask on a wafer;

alignment means having at least a lens, a mirror and array sensor for detecting the relative positions of an alignment mark formed on said mask and an alignment mark formed on said wafer;

a first means for moving an x-y table supporting said wafer;



a second means for moving said alignment means in an orthogonal direction with respect to the optical axis of said focusing lens; and

means for introducing an alignment light, through the face of said mask, opposed to a face illuminated by exposure light.

4,701,051

LASER-DOPPLER-APPARATUS FOR DETERMINING THE SIZE OF MOVING SPHERICAL PARTICLES IN A FLUID FLOW

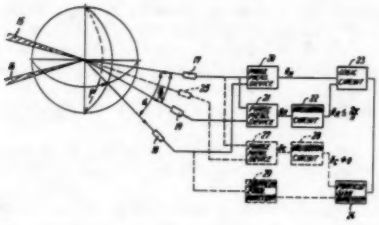
Preben Buchhave, Birkerod; John Knuhtsen, Virum, and Peder E. S. Olidag, Humlebaek, all of Denmark, assignors to Dantec Electronik, Medicinsk Og Videnskabeligt Maleudstyr A/S, Skovlunde, Denmark

PCT No. PCT/DK83/00054, § 371 Date Jan. 16, 1985, § 102(e) Date Jan. 16, 1985, PCT Pub. No. WO84/04592, PCT Pub. Date Nov. 22, 1984

PCT Filed May 18, 1983, Ser. No. 698,182

Int. Cl.⁴ G01N *15/02*

U.S. Cl. 356—336 **7 Claims**



1. A laser-doppler-apparatus for determining the size of moving spherical particles in a fluid flow, comprising a laser beam generator for generating two spatially separated laser beams, focusing means for focusing the laser beams to produce focused beams in a focusing plane which intersect each other under a given angle in an intersecting point in a measuring volume passed by a part of the fluid flow, photoelectric detector means for detecting the scattered radiation caused by a moving particle in the fluid flow in spatially different positions outside the measuring volume and generating electrical signals in response thereto, and signal processing means for determining the particle size on the basis of said electrical signals, characterized in that the detector means comprise two measuring detectors and means for adjusting the detectors into spatial positions, for which in a detecting plane, the beam directions from said intersecting point to the measuring detectors have an angular separation corresponding to a predetermined maximum particle size, for receiving scattered beams from the moving particle in the form of doppler signals having different phase for the two measuring detectors, said signal processing means comprising means for combining the signals from the two measuring detectors to provide a resulting phase difference signal, and means being provided for separating resulting phase difference signals caused by a phase difference between the doppler signals for the two measuring detectors and exceeding 2π.

4,701,052

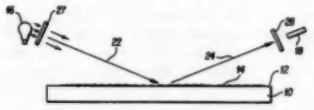
DEW POINT HYGROMETER

Oscar W. Schoen, Jr., P.O. Box 408, Organ, N. Mex. 88052-0408

Filed May 24, 1985, Ser. No. 737,619

Int. Cl.⁴ H04L *25/49*

U.S. Cl. 356—369 **3 Claims**



1. A dew point hygrometer, comprising:

a specular metal surface;

a heat sink for cooling said metal surface;

a polarized light source for providing linearly polarized light incident on said metal surface;

an analyzer for receiving light reflected from said metal surface and transmitting only light with certain predetermined polarization;

a light detector for producing an output when light is transmitted through said analyzer;

wherein condensation forming on said cooled metal surface causes said reflected light to change polarization and be blocked by said analyzer, thus causing said light detector to produce no output.

4,701,053

MARK POSITION DETECTING METHOD AND APPARATUS

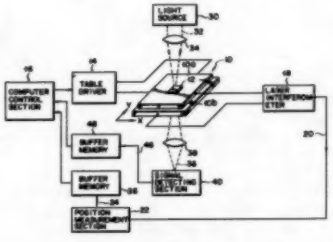
Osamu Ikenaga, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 19, 1983, Ser. No. 563,281

Claims priority, application Japan, Dec. 27, 1982, 57-226703

Int. Cl.⁴ G01B *11/00*

U.S. Cl. 356—375 **23 Claims**



1. An apparatus for detecting a postion of a reference mark which is provided on a workpiece to have first and second

edge portions disposed opposite to and substantially parallel with each other in a first direction, and third and fourth edge portions disposed opposite to and substantially parallel with each other in a second direction normal to the first direction, said apparatus comprising:

movable table means for supporting said workpiece;

light source means for radiating light on said workpiece positioned on said table means;

photodetector means for detecting an image of the edge portions of said reference mark;

edge position detecting means for moving said table means relative to said photodetector means in such a manner that said table means moves forward and backward in the first direction and said photodetector means scans the first and second edge portions in the opposite scanning directions; for detecting a change of light, which is generated when said photodetector means detects the image of said first and second edge portions and incident on said photodetector means, to produce first and second edge data representing the positions of said first and second edge portions; for moving said table means forward and backward in the second direction so that said photodetector means scans the third and fourth edge portions in the opposite scanning directions; and for detecting a change in light, which is generated when said photodector means detects the image of said third and fourth edge portions and incident on said photodetector means, to produce third and fourth edge data representing the positions of said third and fourth edge portions; and

coordinate computing means connected to said edge position detecting means, for computing coordinates of the mark center based on the first to fourth data thus obtained.

4,701,054

MIXING SCREW FOR ICE-CREAM PRODUCTION APPARATUSES

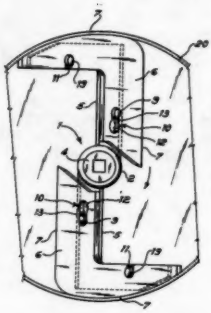
Alberto Cipelletti, Via Emilia, Guardamiglio, Italy (20070), assignor to Ditta Alberto Cipelletti, Italy

Filed May 20, 1985, Ser. No. 735,874

Claims priority, application Italy, May 18, 1984, 21844/84[U]; May 18, 1984, 21847/84[U]

Int. Cl.[4] B01F *7/18, 15/06*

U.S. Cl. 366—312 **6 Claims**



1. Apparatus for ice-cream production in a whipping vessel with a vertical axis and including an inner surface, said apparatus including a mixing screw comprising a central hub for rotatably mounting said mixing screw within said whipping vessel, supporting blade means rotatably projecting from said central hub and being inclined with respect to the plane of rotation of said supporting blade means, L-shaped spreading vane means radially projecting from said central hub and including a horizontal section affixed to said central hub and the vertical section, said vertical section being configured so as to be proximate to and spaced from said side wall of the whipping vessel, said horizontal section and said vertical section being inclined so as to form with said bottom wall and said side wall of said whipping vessel, respectively, an angle having its apex turned in a direction opposite to the direction of rotation of said apparatus, and removable scraping vane means removably secured to said supporting blade means, including edges designed to slide on said inner surface of said whipping vessel.

4,701,055

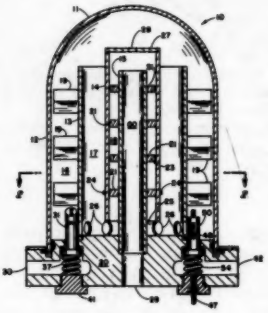
MIXING APPARATUS

Marvin H. Anderson, Denver, Colo., assignor to Fluid Dynamics, Inc., Boulder, Colo.

Filed Feb. 7, 1986, Ser. No. 826,970

Int. Cl.[4] B01F *5/04*

U.S. Cl. 366—336 **16 Claims**



1. A mixing apparatus for mixing two liquids, comprising:

a base plate;

a vertical cylindrical shell mounted to the base plate and enclosing a mixing space therein;

a cylindrical shroud vertically mounted on the base plate in the shell with an annular outer riser chamber between the shroud and the shell, and having an upper end terminating below the upper end of the shell;

first and second inlet means each directing a stream of a respective one of the liquids into said shell substantially tangent to the inner wall thereof and the outer wall of the shroud so as to move upwardly through the outer riser chamber and at the same time to mix the liquids, outlet means for withdrawing a mixture of the liquids from the mixing space;

a central tube carried by the base plate, said central tube having a longitudinal bore therethrough communicating with the outlet means;

an inverted tube mounted intermediate the shroud and the central tube to define a downcomer passageway between the shroud and the inverted tube and an inner riser chamber between the inverted tube and the central tube, said inverted tube having a lower end terminating above the base plate and an upper end terminating above the upper end of the shroud, said downcomer passageway having opposite ends in fluid communication with said outer riser chamber and said inner riser chamber, and said inner riser chamber being in fluid communication with said bore;

recirculation means for withdrawing a portion of the mixed liquid from the downcomer passageway and directing the said portion to the outer riser chamber; and

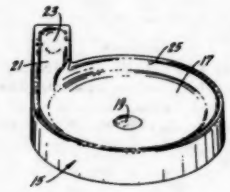
wherein the recirculation means comprises a plurality of apertures extended through the shroud and opening to the outer riser chamber, said apertures being located below the lower end of the inverted tube.

4,701,056

TIMING MECHANISM

Gordon A. Barlow, Glenview, Ill., assignor to Gordon Barlow Design, Skokie, Ill.

Filed Jan. 28, 1987, Ser. No. 7,590
Int. Cl.[4] G04F 1/04
U.S. Cl. 368—89 2 Claims



1. A timing mechanism for use with a board game to indicate by sound and movement the time period allotted for answering a question or performing a turn or function, including:

a sphere,

a circular saucer having an upwardly facing conical plastic surface with a central depression, the central depression sized to receive and hold the sphere,

an inclined ramp formed at the periphery of the circular saucer and having a width and incline sufficient to permit the sphere to roll from the ramp onto the upwardly facing conical surface,

a starting pad at the top of the inclined ramp on which to place the sphere to begin its downwardly roll, and

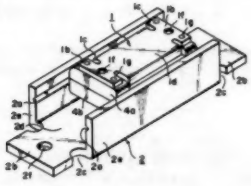
the circular saucer being formed of a thin-walled plastic which produces sound when the sphere rolls down the ramp, circles the upwardly facing conical surface and ultimately comes to rest in the central semi-spherical depression.

4,701,057

LINEAR MOTION ROLLING CONTACT BEARING ASSEMBLY

Yoshihiro Kashiwabara, Yokosuka, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,527
Claims priority, application Japan, Aug. 9, 1985, 60-174215
Int. Cl.[4] F16C 29/06
U.S. Cl. 384—45 11 Claims



1. A linear motion rolling contact bearing assembly, comprising:

a rail extending over a predetermined length and including a pair of first guide grooves extending straight in parallel;

a slider unit provided with a pair of endless circulating paths, each of which is partly defined by a second guide groove extending straight in an opposed relation to the corresponding one of said pair of first guide grooves, said slider unit including a main body in which said pair of endless circulating paths are defined and a frame fixedly attached to said main body;

a plurality of rolling members provided in each of said pair of endless circulating paths, whereby those rolling members located between said first and second guide groove provide a rolling contact between said rail and said slider unit; and

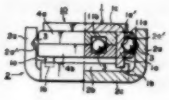
whereby at least one of said rail and said frame is made from a thin plate to be generally U-shaped in cross section and includes an end mounting section formed at least at one end thereof as an extension extending over a predetermined length and having a predetermined width for mounting to a member exterior of said assembly, said end mounting section being provided with at least one notch at a proximal end thereof thereby locally narrowing the width at the proximal end.

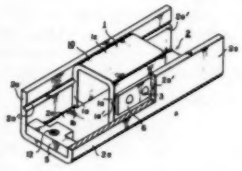
4,701,058

STOPPER MECHANISM OF A LINEAR MOTION ROLLING CONTACT BEARING ASSEMBLY

Tatsuo Mottate, Mitaka, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1986, Ser. No. 898,469
Claims priority, application Japan, Aug. 23, 1985, 60-127851[U]
Int. Cl.[4] F16C 29/06, 29/04
U.S. Cl. 384—45 11 Claims





1. A linear motion rolling contact bearing assembly, comprising:

a rail extending straight over a predetermined distance and including a bottom wall and a pair of outer side walls extending upward from opposite sides of the bottom wall, each of said pair of outer side walls being provided with an outer guide groove extending straight and in parallel with a longitudinal direction of said rail, said rail being provided with a stopper at each end thereof and said rail being integrally formed by bending a plate;

a slider received in a space defined by said rail and including a frame having a top wall and a pair of inner side walls depending downward from opposite sides of the top wall, each of said pair of inner side walls being provided with an inner guide groove extending straight and in parallel with an associated one of said pair of outer guide grooves, each of said pair of inner side walls having a bottom end which is engageable with said stopper at each end of said rail, and said frame being integrally formed by bending a plate; and

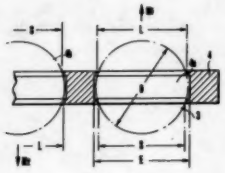
a plurality of rolling members interposed between said rail and said slider as partly fitted in said associated pair of inner and outer guide grooves.

4,701,059

HOLDING DEVICE OF ROLLING BEARING FOR RECTILINEAR MOTION

Yasunori Yokota, Kanagawa, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed May 15, 1986, Ser. No. 863,691
Claims priority, application Japan, Sep. 18, 1985, 60-204197
Int. Cl.[4] F16C *29/04*
U.S. Cl. 384—49 **2 Claims**



1. A holding device of a rolling bearing for a rectilinear motion in which a plurality of rolling members are rectilinearly arranged at predetermined regular intervals in track grooves or track surfaces provided on relatively movable table means and bed means, respectively, said holding device comprising: a substantially rectangular plate-like main body having a rectangular cross section, made by injection molding of plastic material; and a plurality of windows adapted to receive said plurality of rolling members and formed in said main body at predetermined regular intervals in the longitudinal direction thereof so as to separate said rolling members from one another,

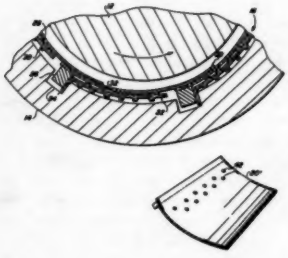
wherein the inside diameter (E) of each of said windows is slightly larger than a diameter (D) of each of said rolling members, the outside diameters (L) and (S) of each of said windows are slightly smaller than said diameter (D), one of said outside diameters (L) of each window is slightly larger than the other outside diameter (S), so as to establish a relation of $S<L<D<E$, and the larger outside diameters and the smaller outside diameters of the respective windows are alternately arranged on the same side surface of said holding device with the larger being adjacent the smaller.

4,701,060

FOIL JOURNAL BEARING COOLING

Alston L. Gu, Rancho Palos Verdes, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 24, 1986, Ser. No. 889,652
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[4] F16C *32/06*
U.S. Cl. 384—106 **14 Claims**



1. A fluid film journal bearing comprising:

a pair of members arranged for relative rotation with respect to one another; and

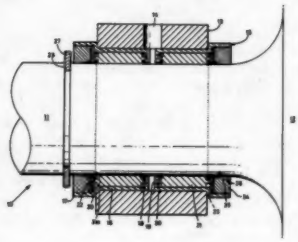
a compliant foil bearing disposed between said pair of relatively rotatable members, said compliant foil bearing including a plurality of overlapping individual foil elements mounted on one of said pair of members and having a plurality of cooling holes configured in an axially extending row and between 0.01 inches and 0.50 inches in diameter.

4,701,061

BRAKE SHAFT BEARINGS

Edgar M. Stubbersfield, Gatton, Australia, assignor to Beryl Grace Stubbersfield, Gatton, Australia, a part interest

Filed Sep. 22, 1986, Ser. No. 909,935
Int. Cl.[4] F16C *33/58*
U.S. Cl. 384—484 **3 Claims**



1. A bearing and seal assembly for rotatably supporting a brake shaft in a bearing or bush housing on a vehicle axle, the assembly including:

a pair of outer bearing races to be inserted into the housing from each side;

a plurality of needle rollers rotatably supported in the outer bearing races adapted to bear against and support the cam shaft;

a respective dust seal housing attached to each outer bearing race of greater diameter than the outer bearing race and connected to the outer bearing race by an annular web engageable with a respective outer face of the bush housing;

a dust seal in each seal housing having at least one lip engageable with the cam shaft so arranged that when grease is pumped into the bush housing to lubricate the needle rollers, excess grease can escape under the lip or lips of the seal but dust is prevented from entering the bush housing; and

the assembly being retained in the bush housing by a circlip engaged in a circumferential groove in the brake cam shaft.

4,701,062

PRINTING RIBBON SPOOL

Walter Ploeger, Jr., Box 869, 420 Williams Rd., Arden, N.C. 28704

Continuation-in-part of Ser. No. 668,550, Nov. 5, 1984, abandoned. This application Oct. 1, 1985, Ser. No. 781,177
Int. Cl.[4] B41J *31/14*
U.S. Cl. 400—202.1 **20 Claims**

15. A rotatable printing ribbon spool comprising:

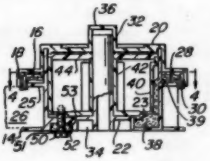
(a) an annular spool body having a hub disposed between a pair of spaced, radially outwardly directed flanges for accommodating a printing ribbon therebetween;

(b) an annular pad of fabric supported by the spool body in a position so that an outer peripheral edge portion can have contact with a side edge of at least a portion of the ribbon disposed between the flanges;

(c) a sealed container of ink coaxially disposed within the hub and having a pair of diametrically opposed weakened areas in its end wall and a flat thereon juxtaposed to a flat on the hub;

(d) a reservoir within the hub and below the sealed container;

(e) a screw threaded to the spool body and being aligned with one of the weakened areas in the sealed container, the screw being turnable for movement in a direction parallel to the axis of the spool body to fracture the weakened area of the sealed container and permit ink to transfer from the sealed container to the reservoir;



(f) an O ring disposed between the screw head and the spool body for maintaining a substantial hermetic seal within the container and reservoir after the container has been fractured;

(g) at least one wick partially disposed in the reservoir and extending upwardly of the hub between an indentation in an outer peripheral wall of the sealed container and an inner surface of the hub and through an opening in the hub to the pad, the wick conducting ink from the reservoir to the pad in a controlled manner by capillary action when the container has been fractured.

4,701,063

PRINTING APPARATUS WITH DOCUMENT CUTTING DEVICE

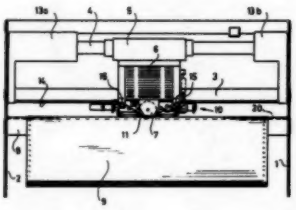
Hans-Joachim Wysk, Villingen-Schwenningen; Dieter Stellmach, Bad Dürrheim; Bernhard Nolte, Gutach; Gerd Gronwald, Braünlingen, and Werner Maedge, Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 844,989

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1985, 3510995

Int. Cl.[4] B41J *11/70*

U.S. Cl. 400—621 **8 Claims**



1. Printing apparatus including a mechanism for cutting a recording medium comprising:

platen means for supporting a recording medium during a printing operation;

printing means mounted to be movable along said platen means in a given direction for printing upon said recording medium;

rotary cutting means including a cutter blade and means mounting said cutter blade on said printing means and movable therewith for cutting said recording medium;

counteracting means on said platen means cooperating with said cutter blade during a cutting operation to facilitate cutting of said recording medium;

control means for actuating said rotary cutter means between an active position in operative cooperation with said counteracting means at which a cutting operation may be effected and an inactive position lifted from cooperation with said counteracting means; and

spring means applying a light spring force to said rotary cutter means when in said active position in a direction generally perpendicular to said given direction of travel of said printing means to urge said rotary cutter means against said counteracting means during a cutting operation;

said control means comprising a slide member and means mounting said slide member to be longitudinally movable between two opposed terminal end positions, said apparatus further including lateral restraint means which define said terminal end positions and which also operate to limit the movement of said printing means;

said apparatus further comprising first cam guide means defined by said slide member and a first axle cooperating with said first cam guide means and connected with said rotary cutter to actuate said rotary cutter means between said active and said inactive positions.

4,701,064

BALL JOINT

Akira Mizusawa, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Oct. 30, 1986, Ser. No. 924,931

Claims priority, application Japan, Nov. 12, 1985, 60-172978[U]

Int. Cl.[4] F16C *11/06*

U.S. Cl. 403—71 **6 Claims**

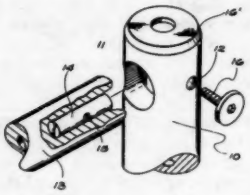
1. In a ball joint comprising a plastic one-piece molding for assembly with a ball stud, said molding comprising two halves having substantially the same shape and each comprising a shell having a semi-spherical recess, a mounting portion provided on said shell for mounting said ball molding on a support member, said two halves being coupled together by hinge means for relative movement between an open apart position in which said halves are attached only by said hinge means and a closed position during assembly with a ball stud such that one half of a ball portion of a ball stud is received in said recess of each shell, said two halves being inseparable when in said closed position, each of said halves being coupled by a respective hinge member to a connecting member which bridges said halves in said closed position, and wherein said mounting portions project from respective side surfaces of said shells.

4,701,065

KNOCKDOWN FURNITURES AND THE STRUCTURAL COMPONENTS THEREFOR

Jose S. Orosa, Unit 3-C Gil-Armi Townhouse, 24 Real Street, Urdaneta Village, Makati, Metro Manila, Philippines

Filed Jan. 7, 1985, Ser. No. 689,423
Claims priority, application Philippines, Dec. 11, 1984, 31563
Int. Cl.[4] B25G *3/00*; F16B *9/00*
U.S. Cl. 403—263 **6 Claims**



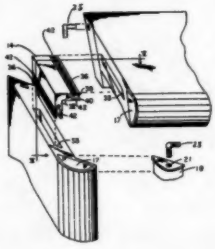
1. Knockdown furniture comprising a set of structural components which are interconnected with each other to form the desired kind and design of furniture pieces, said structural components comprising of predetermined number of legs, rails and couplings which are cut in predetermined lengths from long bamboo poles, said legs and rails being fitted female fittings; at least one of said female fittings being formed with a bolt hole, and at least one of said couplings being fitted with a dowel which is provided with a blind threaded hole aligned with said bolthole whereby said legs and rails are joined to the couplings by means of the male fittings.

4,701,066

DECORATIVE SOUND ABSORBING PANEL FOR FURNITURE

John W. Beam, Princeton, and Edmund T. Paquette, Shrewsbury, both of Mass., assignors to Wright Line, Incorporated, Worcester, Mass.

Filed May 20, 1986, Ser. No. 865,111
Int. Cl.[4] F16B *12/26*
U.S. Cl. 403—298 **7 Claims**



1. An assembly of decorative panels for covering office furniture, comprising at least two panels,

each panel comprising a multisided frame having on one side a beveled surface engageable with a similar beveled surface on an adjacent panel along which surfaces the panels join at a right angle,

an elongated opening in the beveled surface of each panel,

a female, bifurcated, spline within the elongated opening, beneath the beveled surface of each panel, the female spline having a pair of legs, each leg having teeth facing toward each other,

a male spline having a pair of legs at right angles with each other, each leg being bifurcated and each bifurcation having teeth facing away from each other to engage the teeth of one female spline in one panel,

the teeth of the other male spline being engageable with the teeth of the other female spline when the beveled surfaces of each frame are in engagement, and,

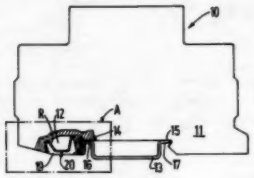
decorative fabric stretched across each panel.

4,701,067

DEVICE FOR SNAP FITTING AN ELECTRIC APPARATUS ONTO A SUPPORT BAR

Guy Eschermann, Quetigny, and Pierre Lemarquand, Velars sur Ouche, both of France, assignors to La Telemecanique Electrique, France

Filed Nov. 6, 1986, Ser. No. 927,479
Claims priority, application France, Nov. 7, 1985, 85 16485
Int. Cl.[4] B25G *3/18*; F16B *21/00*
U.S. Cl. 403—326 **4 Claims**



1. The assembly of a case containing an electrical device and an elongate support member having first and second wings, said case having a wall surface portion which forms first and second cavities or slots respectively cooperating with the first and second wings for attachment of the case to the support member, wherein:

(i) the first cavity is a slot which opens into an inner chamber of the case and the edge surface of the first wing projects through said slot into said chamber;

(ii) a spring blade, housed in the chamber, has a first end surface portion which bears on the chamber surface and a second end surface portion substantially parallel to the edge surface of the first wing; said second end surface portion having at least a folded part which grips on the edge surface of the first wing, said folded part being made of a material harder than the material of the support member, said second end surface portion applying on the edge surface of the first wing a force directed substantially at right angles to said edge surface.

4,701,068

SPLINE ANTI-BACKLASH DEVICE

Rodney R. Andrews, Utica; John H. Ferguson, Sauquoit; Frederick A. Kaiser, Clinton, and William E. Coman, Newport, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 19, 1986, Ser. No. 864,380
Int. Cl.[4] B25G *3/28*; F16B *3/00*
U.S. Cl. 403—359 **11 Claims**

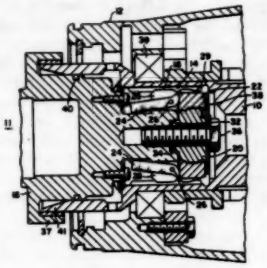
1. A spline with an integral anti-backlash device for engaging an internal spline comprising:

a coupling including an external spline member, having spline teeth, for fitting into mating engagement in the internal spline;

a spline sleeve, having spline teeth, connected to said coupling in alignment with said external spline member and moveable circumferentially with respect to said external spline member; and,

means responsive to centrifugal force to move said spline

sleeve, as said external spline rotates, to circumferentially displace the spline teeth on said external spline member



and the spline teeth on said spline sleeve to lock into the mating internal spline.

4,701,069

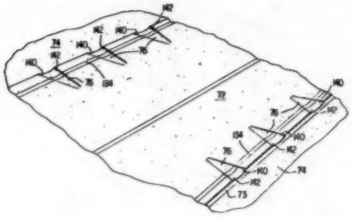
RAIN DRAINAGE GROOVES IN A ROAD AND APPARATUS FOR MAKING THEM

James R. Whitney, P.O. Box 4000, Woodbridge, Va. 22194

Filed Dec. 10, 1986, Ser. No. 940,055

Int. Cl.[4] E01C *9/04, 11/22, 23/16*

U.S. Cl. 404—75 **13 Claims**



1. A road marker system including a road having a shoulder below an edge of the road, a plurality of grooves intersecting said edge of said road and having portions which extend into the road surface, each said groove being straight, each groove having a forward side wall and a rearward side wall, the longitudinal axis of each groove being at an angle to the longitudinal direction of the road, the grooves having slanted or arcuate sides, at least a portion of said slanted or arcuate groove sides being coated with a retro reflective coating, the bottoms of the grooves being slanted downwardly towards said road edge-,each groove being of a maximum depth at the edge of the road and becoming lesser in depth with increasing distance from the edge of the road,the groove bottoms adjacent said road shoulder being even with or above said shoulder, each groove being of a shape complementary to a portion of the curved surface of a cylinder, whereby rain water will run off the sides of the grooves and into the bottoms of the grooves and out of said bottoms to said road edge and onto said shoulder, to thereby maintain the retro reflective coating free of water so that said coating will be visible to thereby make said road edge visible to motorists during hours of both darkness and rain, and whereby when glare on the road is present from illumination other than from headlights of the driver, a series of shadow depressions will be seen by the driver.

8. An apparatus for forming grooves in the surface of a road, the apparatus including, a frame adapted to be attached to and carried by a vehicle, a rotatable cutting cylinder mounted on the frame for rotation about its longitudinal axis, said axis being substantially horizontal, and being at an angle to the longitudinal direction of the road, means carried by the frame for moving said cylinder alternately up and down, and means carried by the frame for rotating said cylinder, the cutting cylinder moving alternately up and down as it rotates about its longitudinal axis, whereby the apparatus forms a plurality of parallel grooves in the surface of a road as the frame is carried along the road at substantial uniform speed without stopping and indexing as each individual groove is cut in the road surface, each groove being of a shape complementary to a portion of the curved surface of the cutting cylinder.

4,701,070

METHOD OF POTHOLE REPAIR

Murray Jelling, 21 Spring Hill Rd., Roslyn Heights, N.Y. 11577

Filed Aug. 6, 1986, Ser. No. 893,736

Int. Cl.[4] E01C *7/35*

U.S. Cl. 404—75 **13 Claims**

1. In the method of patch repairing deteriorated paved areas by the addition of asphaltic patch material, the step which comprises applying an aqueous solution of a water soluble acid salt of a compound selected from a fatty amine, amido-amine, polyamine or cyclic amine to the deteriorated pavement area before placing the patch material in the cavity of the deteriorated area, thereby forming a strong bond in situ between the thus-treated deteriorated paved area and the patch material.

4,701,071

PORTABLE SCREED

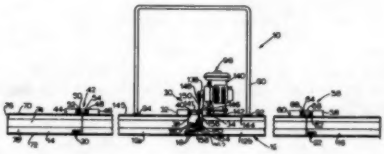
Donald R. Morrison, 6228 Eagle Peak Dr., Charlotte, N.C. 28214

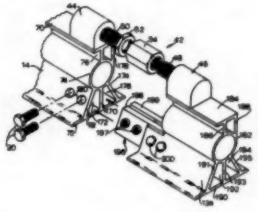
Continuation-in-part of Ser. No. 888,522, Jul. 23, 1986, Pat. No. 4,650,366. This application Jan. 16, 1987, Ser. No. 3,746

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.[4] E01C *19/38*

U.S. Cl. 404—114 **2 Claims**





1. A lightweight, portable concrete screed for screeding a width of concrete confined by forms comprising:

(a) an elongated beam characterized by:

(i) extending in length for the full width of the concrete to be screeded;

(ii) being made up of a plurality of interconnected longitudinally aligned extruded beam sections of similar cross section at least one of which referred to as the motor section is shorter in length than each other section;

(iii) having a first flat horizontal plate portion on the top of each beam section;

(iv) having a hollow, tubular cylindrical section extending through each beam section and located below the said first plate portion thereof with the axis thereof extending parallel to said first plate portion;

(v) having a second flat horizontal plate portion on the bottom of each beam section extending from one beam section to the next below said tubular section for the length of said beam and in a plane extending parallel to said first plate portion and suitable for service as a screed and at the ends thereof for supporting said beam on forms;

(vi) having at least one generally vertical first rib extending through each beam section and joining the said first top plate portion and tubular section thereof; and

(vii) having generally vertical second ribs extending through each beam section between and joining the said tubular section and said second plate portions thereof, and defining therewith an open longitudinally extending passage between each pair of adjacent said second ribs;

(b) means for rigidly interconnecting said beam sections one to the other, comprising:

(i) a tongue fixedly secured at one end within each said passage of a first beam section with the opposite end of said tongue extending from said first beam section and closely fitted within each said passage of a second beam section; and

(ii) means for removably securing the said opposite end of said tongue to said second beam section;

(c) a shaft extending for the length of and rotatably housed within the said tubular section of said beam;

(d) means mounted on said shaft for imparting vibration thereto when rotated;

(e) a motor mounted on said first horizontal plate portion of said motor section and secured thereto;

(f) drive connection means between said motor and shaft enabling said motor to drive said shaft and impart vibrations to said second plate portion; and

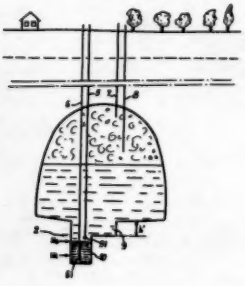
(g) at least one handle secured to said first plate portion for guiding said screed.

4,701,072

DRAINING WELL FOR AN UNDERGROUND CAVITY FOR STORING LIQUEFIED GAS UNDER PRESSURE

Georges Berezoutzky, Cesson, France, assignor to Societe Francaise de Stockage Geologique - Geostock, Paris, France

Filed Aug. 21, 1986, Ser. No. 898,550
Claims priority, application France, Aug. 21, 1985, 85 12562
Int. Cl.[4] B65G *5/00*
U.S. Cl. 405—53 **1 Claim**



1. An underground storage facility for storing a liquefied gas under pressure and at ambient temperature, said liquefied gas having a lower density than water and being immiscible with water, said facility comprising:

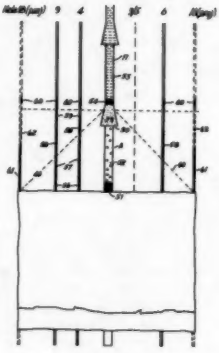
a cavity (1) formed in water-impregnated rock for storing said liquefied gas, the hydrostatic pressure in the rock surrounding the cavity implementing the balancing of the gas liquefaction pressure to establish storage equilibrium, a draining or sump well (2) extending downwardly from a bottom (3) of the cavity for collecting and extracting water which seeps into the cavity from the surrounding rock, said well having an upper portion (9) and a contiguous lower portion (10), said upper well portion having a larger cross-sectional area than said lower well portion, a first tube (6) extending downwardly into the lower well portion for extracting water therefrom, a second tube (5) extending downwardly into the well to a point proximate a junction between the upper and lower well portions for extracting liquefied gas from the facility, and means for filling the second tube with water to a height at which hydrostatic equilibrium is established with the pressure in the cavity to implement the mothballing of the storage facility, the volume of the upper well portion above a lower end of the second tube being greater than the volume of said height of water filled in the second tube.

4,701,073

SHAFT SINKING METHOD

Garrett M. Sainsbury, 10 Waratah Avenue, Dalkeith, Western Australia, Australia

Filed Dec. 3, 1985, Ser. No. 804,290
Claims priority, application Australia, Dec. 5, 1984, PG8420
Int. Cl.[4] E21D *1/00*; E21C *37/00*
U.S. Cl. 405—133 **16 Claims**



1. A method of sinking shafts comprising excavating a series of lifts wherein each lift is excavated by drilling a pattern of blast holes for the full depth of the lift boring a large diameter hole for the full depth of the lift, creating a chamber only at the lower end of the large diameter hole, blasting a portion of the walls of the chamber to deposit rock material into the chamber, extracting at least a portion of the rock material created by the blast and repeating the blasting and extraction step throughout the length of the lift from the bottom to the top and when the volume of said lift is blasted extracting the remaining rock broken material.

4,701,074

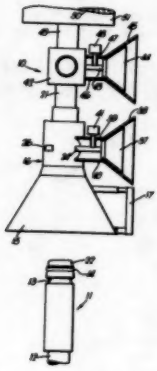
APPARATUS FOR FORMING A GROUTED MEMBER IN DEEP WATER

Stephen G. Hall, Dundee, Scotland, assignor to Wimpey Laboratories Limited, Hayes, England

Filed Apr. 17, 1986, Ser. No. 852,999
Int. Cl.[4] F16L *1/04*
U.S. Cl. 405—169 **8 Claims**

1. Apparatus for forming a grouting member underwater

comprising: a female coupling member for connection to a male coupling member located on a bed beneath the water; guide means for guiding the female coupling member into engagement with the male coupling member; remotely operable locking means, for retaining the male coupling member in engagement with the female coupling member; and means for connecting the female coupling member to a source of grout-



ing material, the locking means comprising a pin rotatably mounted in the female coupling member, the pin having a recess which, in an unlocked position, permits axial insertion of the male coupling member into the female coupling member and in a locked position, engages in an annular groove in the male coupling member to retain the male coupling member in engagement with the female coupling member.

4,701,075

REINFORCED CONCRETE OFFSHORE PLATFORM

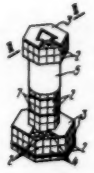
Jury P. Martyshenko, Novopolotsk; Sergei J. Martyshenko; Jury S. Kotelnikov, both of Rostov-na-Donu; Evgeny G. Kutukhtin, Moscow; Nelli I. Ilyasova, Rostov-na-Donu; Jury S. Volkov; Armenak M. Vardanian, both of Moscow, and Misha S. Petrosian, Simferopol, all of U.S.S.R., assignors to Novolipetsky Politekhnichersky Institut Imeni Leninskogo Komsomola Belorusii, Novolipetsk, U.S.S.R.

PCT No. PCT/SU84/00019, § 371 Date Nov. 21, 1985, § 102(e) Date Nov. 21, 1985, PCT Pub. No. WO85/04683, PCT Pub. Date Oct. 24, 1985

PCT Filed Apr. 12, 1985, Ser. No. 809,890

Int. Cl.[4] E02D *21/00, 25/00, 27/38*

U.S. Cl. 405—217 **4 Claims**



1. A reinforced concrete offshore platform comprising a honeycomb foundation (A), a supporting structure (B) and an above-surface section (C) carrying appropriate equipment, characterized in that the honeycomb foundation (A) and the supporting structure (B) are made of prefabricated reinforced concrete elements which are polyhedral hollow prisms (1, 2) arranged with gaps (6) between the external sides thereof and joined by a system of prestressed vertical diaphragm walls (4) and horizontal diaphragm walls (3) formed by pre-tensioning reinforcing bars (7, 8) placed in the gaps (6) between the faces of the prisms (1, 2) and casting-in-situ said gaps later on.

4,701,076

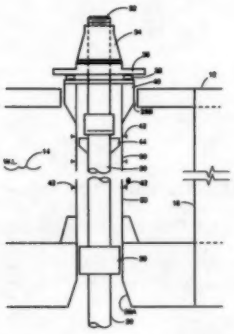
TERMINATOR ASSEMBLY FOR A FLOATING STRUCTURE

Hin Chiu, Meadows, and Johnce E. Hall, Kingwood, both of Tex., assignors to Amoco Corporation, Chicago, Ill.

Filed Aug. 1, 1986, Ser. No. 893,067

Int. Cl.[4] E02B *17/00*; B63B *35/44*

U.S. Cl. 405—224 **11 Claims**



1. A terminator assembly for use in mooring a floating surface to the floor of a body of water, the floating structure having an upper support and a lower support, comprising:

a hawsepipe extending downwardly from adjacent the upper support and supported by the lower support,

a tension member extending downwardly from adjacent the upper support through the hawsepipe and the lower support, the tension member having a lower end adapted for connection to the floor of the body of water, and

locking means connected to an upper portion of the tension member for maintaining the tension member in tension by acting upon an upper portion of the hawsepipe without transferring primary tension load forces to the upper support.

4,701,077

APPARATUS FOR WITHDRAWING A TUBE OR PILE WHICH HAS BEEN DRIVEN INTO THE SOIL

Dik Arentsen, Leiderdorp, Netherlands, assignor to IHC Holland N.V., Papendrecht, Netherlands

Filed May 27, 1986, Ser. No. 866,957

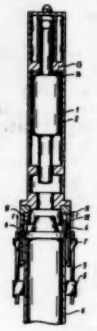
Claims priority, application Netherlands, Jun. 3, 1985, 8501597

Int. Cl.[4] E02D *7/06*

U.S. Cl. 405—232 **3 Claims**

1. In apparatus for withdrawing a tube or pile, comprising a housing with a ram movable upwardly and downwardly in said housing, means for moving said ram and means on the housing of the ram as well as means on the outer side of the tube or pile which with the before mentioned means form a lost-motion connection; the improvement in which the housing

of the ram device has a plurality of downwardly shiftable pressure members which are regularly distributed around the



axis of the housing and engage a pile head or cap on the pile to take up said lost motion.

4,701,078

PILE CONSTRUCTION METHOD FOR IMPROVING BEARING POWER

Lin J. Jse, 4th Fl., No. 37-39, Sec. 2, Shih Chuan Road, Panchiao City, Taiwan

Continuation-in-part of Ser. No. 602,595, Apr. 20, 1984, abandoned. This application May 16, 1986, Ser. No. 864,079

Int. Cl.[4] E02D *5/44*

U.S. Cl. 405—238 **5 Claims**

1. A method of constructing a cast-in-place concrete pile including driving a pile casing into the earth, making a hollow below the end of the pile casing, filling the pile casing and the hollow with cement mortar to form a concrete pile with an enlarged base, wherein the improvements comprise: before filling the pile casing and the hollow with cement mortar, lowering an injection tube into the pile casing until the tube extends into the hollow; after filling the pile casing and the hollow with cement mortar and before the cement mortar consolidates, injecting a soil stabilizing agent through the injection tube and then through the cement mortar into the surrounding soil so as to form first passages in the enlarged base; after the cement mortar consolidates, injecting a highly flowable cement mortar through the injection tube and then through the first passages into the surrounding soil so as to form a supplemental concrete body; and subsequent to the injection of the highly flowable cement mortar and before the highly flowable cement mortar consolidates, injecting a soil stabilizing liquid agent through the injection tube, then through the first passages, and finally through the highly flowable cement mortar into the surrounding soil so that second passages are formed in the supplemental concrete body.

4,701,079

PIVOT CONNECTIONS FOR USE WITH MINE ROOF SUPPORTS

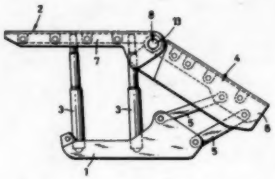
Horst Meissner, Bergkamen-Oberaden, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Aug. 27, 1986, Ser. No. 900,978

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1985, 3531668

Int. Cl.[4] E21D *19/00*

U.S. Cl. 405—296 **9 Claims**



1. In a mine roof support comprising a roof engaging structure, a floor engaging structure, one or more hydraulic props disposed between the roof and floor engaging structures, a goaf shield, means pivotably interconnecting the goaf shield to the roof and floor engaging structures, gap seals in the form of L-shaped plates displaceably mounted on the goaf shield and the roof-engaging structure, said plates having side walls which overlaps in the regions where the goaf shield and the roof engaging structure are interconnected and a pivot connection between the overlapping side walls and the plates; the improvement comprising the pivot connection is composed of aligned apertures in the overlapping side walls, a pivot pin engaged through said apertures, a peripheral groove formed in an inner end region of the pivot pin relative to the support, support means including an arcuate yoke engaging in the groove and releasable locking means for securing the support means in position.

4,701,080

TRANSFER SYSTEM FOR DRY FLOWABLE MATERIAL

Gerhardt van Aalst, Koudekerk aan den Rijn, Netherlands, assignor to Cyclonaire Bulk Cargo Systems, Inc., Henderson, Nebr.

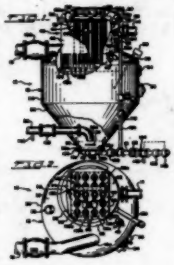
Filed Mar. 4, 1985, Ser. No. 707,770

Int. Cl.[4] B65G *53/28*

U.S. Cl. 406—109 **3 Claims**

1. In a material transfer system which includes a transfer vessel having upper and lower ends and defining a chamber internally thereof, a supply conduit intersecting the chamber generally adjacent the upper end thereof in a manner to facilitate the introduction of fluid entrained particulate material into the chamber, a discharge conduit intersecting the chamber in a manner to facilitate discharge of particulate material from said chamber, a vacuum conduit intersecting the chamber generally adjacent the upper end thereof in a manner to enable selective drawing of particulate material into the chamber from said supply conduit during a fill cycle, a pressure conduit intersecting the chamber in a manner to enable selective introduction of fluid pressure into the vessel so as to cause discharge of particulate material outwardly through said discharge conduit, and filter means operatively associated with said vessel in a manner to filter out particulate material from fluid drawn from the chamber into the vacuum conduit means during filling of the vessel chamber; the improvement wherein said filter means

includes a filter containment housing mounted on the upper end of said vessel so as to extend downwardly into said vessel chamber, said containment housing including an annular wall defining a filter chamber having a lower edge disposed within said vessel chamber at a level below the entry end of said supply conduit, said filter means further including filter element means supported within said filter containment housing



above the plane of said lower edge thereof, said filter containment housing having a plurality of openings formed through said annular wall above said lower edge thereof to enable filling of said vessel chamber to a level higher than said lower edge of said containment housing, said annular wall being devoid of openings therethrough in a region juxtaposed to said supply conduit entry end.

4,701,081

BORING PROCESS AND APPARATUS

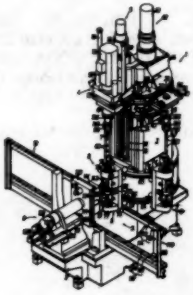
Hitoshi Hashimoto, Iruma; Yoshihiro Tamaki, Tsurugashima; Kazufumi Mikami, Kawagoe, and Kiyoshi Shimogai, Oozu, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1986, Ser. No. 827,785

Claims priority, application Japan, Feb. 15, 1985, 60-27787

Int. Cl.[4] B23B *41/12*

U.S. Cl. 408—1 R **16 Claims**



1. A process for boring a workpiece having a plurality of axially spaced holes which are to be bored over a relatively great distance in the axial direction of the workpiece, comprising the steps of:

suspending for universal pivotal movement a boring bar which has a plurality of cutters provided thereon at axially spaced positions and extending radially eccentrically at one side of the bar, said cutters being adapted for boring a plurality of holes in a workpiece provided on a common axis at axially spaced positions;

bringing and locating the workpiece to a position below the boring bar with the axis of said holes being vertical and transversely offset from the axis of the boring bar and then lowering said boring bar while holding the offset location of the bar relative to the holes to pass the boring bar through the holes in the workpiece, so as to avoid contact of the cutters on the bar with the holes,slidably and rotatably supporting the boring bar at least at two points thereof axially spaced apart from each other, aligning the axis of the boring bar and the axis of the holes in the workpiece by transversely displacing the workpiece relative to the boring bar; and

effecting boring of said holes by providing relative rotation and axial movement between the boring bar and the workpiece and the axis of the boring bar remaining aligned with the axis of the workpiece.

4,701,082

MULTIPURPOSE MACHINING UNIT

Jurg Fumey, Kirchdorf, Switzerland, assignor to Suhner Intertrade AG, Brugg, Switzerland

PCT No. PCT/CH83/00090, § 371 Date Mar. 21, 1984, § 102(e) Date Mar. 21, 1984, PCT Pub. No. WO84/00512, PCT Pub. Date Feb. 16, 1984

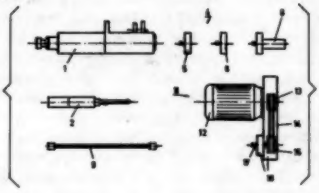
Continuation of Ser. No. 598,288, Mar. 21, 1984, abandoned.

This PCT application Jul. 25, 1983, Ser. No. 782,151

Claims priority, application Switzerland, Aug. 4, 1982, 4687/82

Int. Cl.[4] B23B *47/14*

U.S. Cl. 408—127 **2 Claims**



1. A multipurpose machining unit having a group of interrelated component parts capable of being assembled to transmit power from a power source having an interchangeable speed belt power transmission means, the group comprising the combination of:

plural plug-in interchangeable gear set means each adapted to be connected to receive power from the interchangeable speed belt means,

each plug-in interchangeable gear set means comprising input gear means having an axis of rotation and receiving power at a first rotational speed and disposed coaxially therewith an output gear means transmitting power at a second rotational speed different from said first rotational speed, and

a pneumatic spindle feed means being adapted to be connected to receive power from at least one of the plug-in interchangeable gear means at a rotation speed different from the rotational speed of the interchangeable speed belt transmission means.

4,701,083

TOOL HOLDER FOR DRILLING AND CHISELLING TOOLS

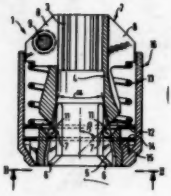
Paul Deutschenbaur, Germering; Hans Rupprecht, Munich, both of Fed. Rep. of Germany; Norbert Burtscher, Thüringen, Austria, and Berno Nigg, Gamprin, Liechtenstein, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Sep. 13, 1985, Ser. No. 775,612

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1984, 3434076

Int. Cl.[4] B23B *31/12*

U.S. Cl. 408—240 9 Claims



1. Tool holder for drilling and chiselling tools comprising an axially extending receiving sleeve having a first end and a second end spaced apart in the axial direction and a bore formed by said sleeve and extending in the axial direction therethrough, said bore having a first axially extending bore section extending from the first end toward the second end, and a second axially extending bore section extending from said second end toward said first end, said first bore section arranged to receive a shank of a drilling or chiselling tool and said second bore section arranged to receive a drive spindle of a drive device, spring biased locking elements located in said receiving sleeve within said first bore section, said first bore section has inwardly projecting axially extending shoulders therein arranged to interfit with correspondingly shaped grooves on the shank of a drilling or chiselling tool, said locking elements are arranged to fit into recesses in the shank of a drilling or chiselling tool, wherein the improvement comprises that said first bore section has an axially extending conically shaped inner surface with the diameter thereof reducing from the first end toward the second end of said receiving sleeve and a radially outer surface, said shoulders project in the axial direction radially inwardly from said conically shaped inner surface and are spaced equiangularly apart around said conically shaped surface, and said locking elements are axially elongated pins extending transversely of the axial direction of said receiving sleeve and extending generally tangentially of said first bore section, each of said pins has a pair of opposite ends spaced apart in the axial direction of said pins, the opposite ends of said pins remain spaced radially outwardly from said conically shaped inner surface and extend outwardly of said radially outer surface, means located outwardly from said radially outer surface and in contact with the opposite ends of said pins for spring biasing said pins intermediate the opposite ends thereof radially outwardly of said conically shaped inner surface so that intermediate the opposite ends said pins are arranged to engage in the grooves on the shank of the drilling or chiselling tool to be secured in said tool holder.

4,701,084

ATTACHING METHOD FOR SHELL-TYPE MILLING CUTTER

Manabu Ide, Fujinomiya, Japan, assignor to Kabushiki Kaisha Aideie, Shizuoka, Japan

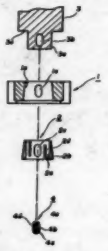
PCT No. PCT/JP85/00687, § 371 Date Aug. 13, 1986, § 102(e) Date Aug. 13, 1986, PCT Pub. No. WO86/04001, PCT Pub. Date Jul. 17, 1986

PCT Filed Dec. 16, 1985, Ser. No. 903,428

Claims priority, application Japan, Jan. 10, 1985, 60-2983

Int. Cl.[4] B23B *1/00*; B23C *5/26*

U.S. Cl. 409—131 1 Claim



1. A method of attaching a shell-type milling cutter comprising the steps of:

loosely fitting the milling cutter onto a cutter arbor which has a fitting shaft which is formed with a straight stepped portion at one end by fitting a tapered hole in said milling cutter, which is larger in diameter than said fitting shaft, onto said fitting shaft and engaging with said stepped portion;

inserting a tapered bushing into a gap between said fitting shaft and said tapered hole;

inserting a cotter through a cotter hole extending through said fitting shaft, milling cutter and bushing; and

fixing said milling cutter to said shaft by forcing said tapered bushing into said gap.

4,701,085

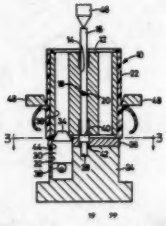
METHOD AND APPARATUS FOR EXTERNAL BROACHING OF RESIN-COATED PARTS

Yosio Kuroiwa, Toyota, and Takuo Sibata, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 30, 1986, Ser. No. 868,512

Int. Cl.[4] B23D *37/12, 41/06*

U.S. Cl. 409—244 9 Claims



1. A method of broaching an outer surface of a resin layer of a resin-coated part having a metallic body whose external side surface is coated with the resin layer, comprising the steps of:

preparing a broaching apparatus with a movable broach having a cutting edge contour corresponding to an en-

tirety of a desired external profile of said resin-coated part to which said resin-coated part is finished by broaching said outer surface of said resin layer;

preparing a backing plate having an external profile similar to said cutting edge contour of said broach, and having an external dimension smaller than said cutting edge contour by a predetermined slight value, said external dimension of said backing plate being larger than a contour of said external side surface of said metallic body;

positioning said backing plate on a work bed of said broaching apparatus such that said external profile of said backing plate is inwardly spaced from said cutting edge contour of said broach in a plane perpendicular to a direction of movement of said broach; and

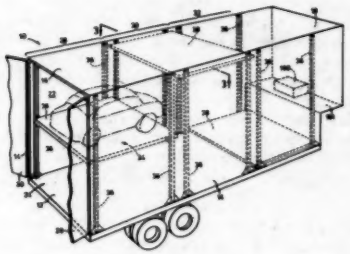
placing said resin-coated part on said backing plate such that said backing plate is held in contact with an end face of said part at which said broach terminates a broaching cut in said direction.

4,701,086

TRANSPORTATION VAN HAVING LOAD ELEVATING PLATFORM LOCATED THEREIN

Robert J. Thorndyke, Oshawa, Canada, assignor to Atlantis Projects Inc., Oshawa, Canada

Filed Jun. 2, 1986, Ser. No. 869,353
Claims priority, application Canada, Feb. 10, 1986, 501512
Int. Cl.⁴ B60P *3/08*
U.S. Cl. 410—26 **5 Claims**



1. A transportation van comprising:

(a) a road going van body having a cargo compartment which is open at one end and which has a generally planar floor, a pair of oppositely disposed upright side walls and a top wall,

(b) an elevator platform proportioned to extend across the cargo compartment between said side walls, said elevator platform having a drive compartment formed therein,

(c) guide means mounted on said side walls and cooperating with said elevator platform for guiding the movement of the platform with respect to the compartment,

(d) extensible ram means located in said drive compartment of said platform, one end of said ram means being secured to said platform and the other end being movable with respect to said platform,

(e) elevator cable means having one end anchored with respect to said van body and its other end secured with respect to said elevator platform, said other end of said ram means engaging said elevator cables to cause said platform to move to and fro between a lowered position at the floor of the van, an intermediate position spaced above the floor and an upper position proximate the top wall of the cargo compartment,

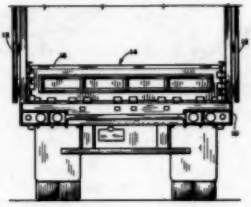
(f) latch means carried by said platform and operable to releaseably latch said platform in said intermediate position so as to be capable of supporting a load when locked in said intermediate position.

4,701,087

PROTECTIVE GATE

Jerry T. Cain, Sapulpa; James M. Mason, Tulsa, and Tommy D. Rainey, Broken Arrow, all of Okla., assignors to SavR Company, Inc., Sapulpa, Okla.

Filed Aug. 28, 1985, Ser. No. 770,099
Int. Cl.⁴ B60P *7/14*
U.S. Cl. 410—94 **3 Claims**



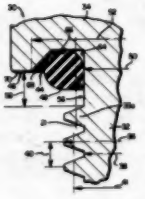
1. A protective gate adapted to be retrofitted within a truck trailer freight container for protection of said container and its freight from damage during transit wherein said container includes a floor, two opposite side walls, and a pair of center opening rear doors for receiving freight to be transported; said protective gate comprising a rigid plate having top, bottom and side edges wherein said plate is spaced inwardly from said freight container rear doors; a plurality of outer brace members extending from the face of said plate and reinforcing said plate; means for hinging said bottom edge of said plate to said container floor to allow movement of said plate from an open position in a plane horizontal to said floor into a closed position perpendicular to said floor; a plurality of protuberances extending rearwardly from said container floor, such that said outer brace members will rest against said protuberances when said gate is in said open position; and means to couple said plate side edges to said container side walls in a position perpendicular to said container floor, thereby preventing movement of said gate relative to said container.

4,701,088

UNDERCUT SEALING THREADED FASTENER

Russell L. Crull, Byron, Ill., assignor to Textron Inc., Providence, R.I.

Filed Nov. 6, 1985, Ser. No. 795,616
Int. Cl.⁴ F16B *33/00*
U.S. Cl. 411—369 **10 Claims**



1. An undercut, sealing externally threaded fastener for engagement with a workpiece including an internally threaded aperture for receiving said externally threaded fastener, said fastener comprising a head portion having a substantially flat undersurface, and a shank portion extending axially from the undersurface of said head portion, said shank having an externally threaded portion and an unthreaded portion disposed intermediate said externally threaded portion and said head portion, said threaded portion defining a thread form including

a predetermined root and crest diameter and a given thread pitch; said head portion including a groove formed in the undersurface thereof and an annular flat surface portion disposed radially outward of said groove, and said groove having an inner diameter less than the crest diameter of the female thread on said workpiece; the unthreaded shank portion extending from the inner diameter of said groove and being formed continuous with said inner diameter of said groove and having an outer diameter less than the crest diameter of said female thread; and an annular sealing ring disposed in said groove, such that due to said groove and said unthreaded shank portion having a diameter less than the crest diameter of said female thread, said fastener may be fully seated in said workpiece to bring the annular flat surface portion of said head portion into surface-to-surface contact with the workpiece, and the volumes of the sealing ring and the groove being selected such that said sealing ring will be deformed and substantially fill said groove without extruding material between the flat surface portion of the fastener and the workpiece nor axially between the female thread and the shank portion when said surface-to-surface contact is attained.

4,701,089

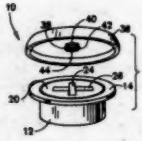
QUICK RELEASE COVER

Hans Nettel, Oceanside, Calif., assignor to Tom-Kap-Co, San Diego, Calif.

Continuation-in-part of Ser. No. 661,980, Oct. 18, 1984. This application Jun. 10, 1986, Ser. No. 872,702

Int. Cl.[4] F16B *19/00, 33/00*

U.S. Cl. 411—373 **14 Claims**



1. A cover assembly for a closure comprising in combination:

a closure having a generally circular cylindrical configuration with an axis, a generally flat planar top surface and a threaded generally cylindrical portion on the opposite side thereof from said top surface for threadably engaging and securing to the opening of a receptacle;

a cross slot recess formed of slots having vertical walls intersecting at a right angle and forming corner edges parallel to said axis at the intersection of said slots in said top surface; and

a flat planar cover for covering said closure, said cover having a releasable gripping means comprising a plurality of elastic fingers extending from a surface thereof in a circular array for selectively extending into said slots at a first rotary position of said closure and for selectively engaging and gripping the corner edges at a second rotary position for retaining said cover in position over said closure.

4,701,090

METHOD OF MANUFACTURE OF A CAN END WITH A PUSH IN VENT TAB AND MAIN TAB

Edgar D. Smith, Ada, Mich., assignor to Jerone Technologies, Inc., Minneapolis, Minn.

Filed May 12, 1986, Ser. No. 862,097

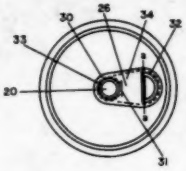
Int. Cl.[4] B21D *51/44*

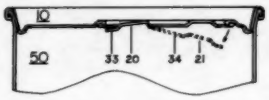
U.S. Cl. 413—13 **12 Claims**

1. A method of manufacturing can ends having a push down vent tab and a push down main tab, with recessed socre lines under a double folded ridge of metal including the steps of:

a. depressing a bubble having a perimeter in a portion of a blank can end having a flat surface,

b. reforming the bubbled area, in a die, to form a depressed flat surface parallel to the blank can end's flat surface and having a raised vent button having a perimeter, a raised tab button havinq a perimeter and a perpendicular side wall around the perimeter of the bubbled area,





c. scoring a vent score most of the way around the perimeter of the vent button and forming a ridge in the can end to act as a bend line on the side of the vent button not scored,

d. scoring a tab score partly around the perimeter of the tab button adjacent to the side wall and extending toward the vent tab, adjacent to the side wall,

e. folding the side wall, in one die operation, so that the score lines are mostly under a ridge created by the fold,

f. spraying a sealant material on the can end.

4,701,091

APPARATUS FOR PILING PORTLAND CEMENT PACKAGES IN ALIGNMENT ON PLATFORM

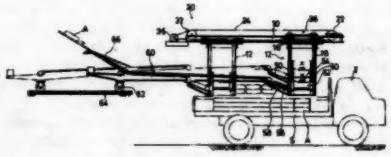
Kouji Yamauchi, and Chikai Ueda, both of Tokyo, Japan, assignors to Mitsubishi Mining & Cement Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1986, Ser. No. 871,872

Claims priority, application Japan, Jun. 13, 1985, 60-89471

Int. Cl.[4] B65G *57/06*

U.S. Cl. 414—70 **7 Claims**



1. An apparatus for piling packages of cement in alignment on a loading platform, comprising:

at least one first guide rail fixed position;

a conveyor extending in the lengthwise direction of said first guide rail and movably mounted on said first guide rail, for transporting packages of cement;

supplying means for supplying packages of cement, one by one, to said conveyor;

a pair of second guide rails provided at one end of said first guide rail, extending parallel to each other along said first guide rail and spaced apart from each other for a prescribed distance, said second guide rails being arranged

such that the loading platform of a truck or the like can be positioned below the second guide rails; and

a loading device suspended from said second guide rails and being able to move while guided by said second guide rails, said loading device having a distributing head coupled to one end of said conveyor, and an elevating means for lifting and lowering the distributing head, said distributing head comprising;

a pair of carriages able to receive one package of cement each, from the conveyor, and movable along two independent distributing routes extending perpendicular to said second guide rails;

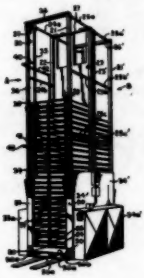
driving means for moving said carriages along the distributing routes and stopping said carriages at predetermined positions in the distributing routes; and release means for releasing packages of cement from the carriages, allowing the bags to fall.

4,701,092

PALLET DISPENSER

Gary L. Reynaud, Strafford, and Calbert Allcorn, Springfield, both of Mo., assignors to Yarbrough'o Machine Shop, Springfield, Mo.

Filed Feb. 15, 1985, Ser. No. 702,089
Int. Cl.[4] B65G 59/06
U.S. Cl. 414—115 **24 Claims**



1. A process of first establishing a vertical stack of pallets and thereafter subsequently dispensing pallets from the low end of said stack, each of said pallets having normally horizontal top and bottom walls, such walls both vertically spaced apart and connected together by normally vertical side walls, comprising the steps of:

(1) first supporting said stack of pallets on a plurality of opposed shelf members underlying portions of the side edges of the bottom wall of the bottommost pallet in said stack, said stack normally supported by said shelf members above floor level at a height at least greater than the thickness of the one pallet and at least sufficient to permit at least the bottommost pallet of the stack to be lowered to ground level free and clear of the low end of the remainder of said stack,

(2) gripping the opposed, lateral side walls of at least one of the next lowermost pallets in said stack by opposed, horizontal beam members with sufficient inwardly applied, lateral force so as to grab and vertically suspend at least said grabbed pallet with sufficient force to enable the support thereon of the remaining, upwardly extending pallets of the stack thereon,

(3) lowering at least the first bottommost pallet on said shelf members moving in as linear path downwardly, clear of the remaining stack and said gripped next lowermost pallet, to closely adjacent floor level and disengaging said opposed shelf members from under said first pallet by coordinated, lateral, outward motion of said members, whereby at least said first pallet is deposited on substantial floor level and thereafter is available for removal from under the remaining suspended stack, thus to be lifted up and carried away from under said suspended stack,

(4) returning said shelf members inwardly and upwardly to underlie and engage the lower edge surfaces of the bottom wall of the side suspended, but now bottommost, pallet in the remaining stack, and

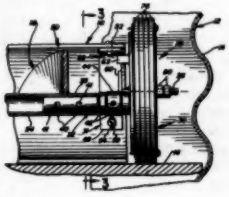
(5) withdrawing said opposed, horizontal beam members from engagement with the side walls of said now bottommost pallet so that it and the remaining pallet stack piled thereon is once more supported on said underlying shelf members.

4,701,093

SWEEP AUGER APPARATUS

Marvin G. Meyer, Sheffield, Iowa, assignor to Sukup Manufacturing Company, Sheffield, Iowa

Continuation of Ser. No. 352,796, Feb. 26, 1982, abandoned. This application Oct. 31, 1985, Ser. No. 795,701
Int. Cl.[4] B65G 65/46
U.S. Cl. 414—312 **6 Claims**



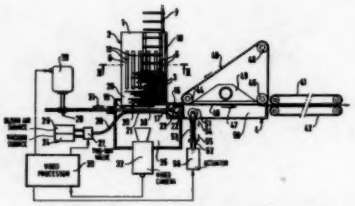
1. Apparatus for moving granular material radially of a circular storage bin along a floor of the bin toward the center of the bin floor, said apparatus comprising: an elongate auger with a longitudinal axis to be disposed radially of such a bin above and proximate the floor thereof, said auger having a leading edge, a trailing edge, one end disposed at the center of the bin and a distal end disposed radially outward of the center of the bin, said one end of said auger including means for connection to power means at the center of such a bin for rotating said auger about its longitudinal axis; a support and drive assembly located radially outward of the auger and mounted on the distal end of said auger; said support and drive assembly including a first shaft coaxially secured to said auger for rotation therewith, a second shaft disposed rearward of said first shaft, a drive wheel mounted on said second shaft for supporting said distal end of said auger on such a floor and for advancing said auger around the central vertical axis of such a bin, and a speed reduction gear drive connected to said first shaft for rotating said drive wheel at a speed of rotation which is substantially less than the speed of rotation of said auger and for transmitting an advancing force from said auger to said drive wheel; said support and drive assembly providing the sole support for said distal end of said auger and being disposed entirely rearward of the leading edge of said auger so that the leading edge of the auger protrudes forwardly of the support and drive assembly for engaging the granular material ahead of the support and drive assembly.

4,701,094

SEPARATOR FOR HETEROGENOUS FLAT OBJECTS

Francois Courjaret, Paris; Gilbert Del Fabbro, Valence; Jean-Noël Devic, Cornas; Michel Divoux, Chateauneuf sur Isere; Guy Forella, Saint Peray; Jean-Pierre Hamant, Valence; Dominique Tubiana, Nanterre, and Claude Pavie, Houilles, all of France, assignors to Compagnie Generale d'Automatisme CGA-HBS, Paris, France

Filed Jan. 30, 1986, Ser. No. 824,036
Claims priority, application France, Jan. 30, 1985, 85 01306
Int. Cl.[4] B65H 7/16
U.S. Cl. 414—330 8 Claims



1. A separator for heterogenous flat individual articles having broad faces, said separator comprising: an article feed, at least one delivery conveyor located some distance away from the feed to convey the individual articles which it receives sequentially, one after another, and a transfer station supplied with said articles from the article feed and provided with at least one pickup arm having a suction head with a plurality of orifices on one face substantially parallel to the broad faces of the articles present in the transfer station, a vacuum source, a blown air source, a drive motor for said at least one arm, a video imaging device to register the instantaneous scene at the transfer station and a video processor coupled to said imaging device and controlling the said at least one arm, means for selectively connecting said orifices of the suction head to said vacuum source and said blown air source via individual air lines equipped with means for selectively switching connections to one or the other of said sources under the control of said video processor.

4,701,095

TRANSPORTABLE MATERIAL CONVEYING APPARATUS

Leslie N. Berryman; Gail F. Davis, and Herbert J. Horinek, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 687,094, Dec. 28, 1984, abandoned.
This application Jul. 31, 1986, Ser. No. 894,440
Int. Cl.[4] B65G 67/02
U.S. Cl. 414—332 18 Claims

1. A transportable proppant material conveying apparatus used in transporting particulate proppant material from a particulate proppant material supply container to a mixing apparatus where said particulate proppant material is blended with fluids used in well operations at well sites, said transportable proppant material conveying apparatus comprising:

a transportable frame to facilitate the transportation of said apparatus to and from well sites;

a controllable gathering conveyor means, mounted on said frame, for gathering said particulate proppant material from said particulate proppant supply container and delivering said particulate proppant material to another location on the transportable frame;

a surge bin means, mounted on said frame, for receiving from said gathering conveyor, holding, and discharging said particulate proppant material to be transported to said mixing apparatus to be blended with said well fluids used in said well operations at well sites, said surge bin means having a holding capacity greater than the volume of said particulate proppant material which can be carried at one time by said gathering conveyor means, said surge bin means being so constructed that all of said particulate proppant material contained in said surge bin means can be discharged through a single outlet to thereby prevent the formation of dead spaces where substantial volumes of said particulate proppant material could be trapped within said surge bin means;

a discharge conveyor means, mounted on said frame below an outlet of said surge bin means, for receiving said particulate proppant material from said outlet and for conveying said particulate proppant material to a discharge point to be discharged into said mixing apparatus to be blended by said mixing apparatus with said well fluids in said well operations at well sites, said discharge conveyor means being independently controlled and capable of intermittent independent operation to control the flow of said particualte proppant material to said mixing apparatus to be blended with said fluids in said well operations at well sites, said discharge conveyor means including an endless conveyor belt;

adjustable screed means, operatively associated with said endless conveyor belt on a downstream side of said outlet of said surge bin means, for controlling a cross-sectional area of particulate proppant material which can be carried on said conveyor belt of said discharge conveyor means;

pivotal mounting means, operatively associated with said discharge conveyor means, for permitting said discharge conveyor means to pivot about a substantially vertical axis relative to said frame;

extension means, operably associated with said discharge conveyor means, for permitting said discharge point to be moved horizontally relative to said frame, said extension means and said pivotal mounting means permitting said discharge point to be selectively located within a predetermined area relative to said frame;

discharge control means, operably associated with said discharge conveyor means, for controlling a speed of said conveyor belt, so that a discharge rate of said particulate material from said discharge conveyor means is determined by a combination of said adjustable screed means and said discharge control means;

and

discharge rate indicator means for indicating the rate at which particulate proppant material is being discharged into said mixing apparatus from said conveying apparatus to be blended with fluids used in well operations at well sites.

4,701,096

WAFER HANDLING STATION

Daniel J. Fisher, Jr., Chelmsford, Mass., assignor to BTU Engineering Corporation, North Billerica, Mass.

Filed Mar. 5, 1986, Ser. No. 836,294
Int. Cl.[4] B65G 1/06, 17/32
U.S. Cl. 414—416 21 Claims

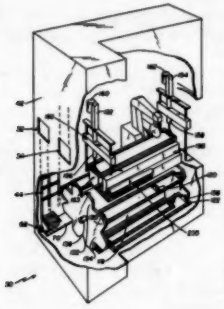
21. A wafer handling station for an automated furnace system having an elevator transport mechanism, comprising:

carrier input means for receiving wafer-loaded carriers for processing;

carrier output means for delivering wafer-loaded carriers after processing;

quartzware receiving means for providing an elevator-transport access port;

arraying means coupled to the input means for arraying the carriers input thereinto as an array representing a tube-load of wafers; and



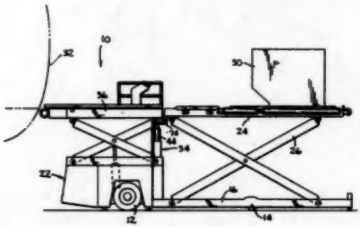
transfer means coupled between the carrier input means, the carrier output means, and the quartzware receiving means for transferring a tube-load of wafers to the quartzware receiving station for processing, to transfer the said wafers from the quartzware receiving station back to their particular carriers after processing, and for transferring the said wafers of a tube-load of wafers to the output means.

4,701,097

REAR PLATFORM LIFT

Charles R. Sturtz, Orlando, Fla., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 22, 1986, Ser. No. 909,813
Int. Cl.[4] B65G *67/02*
U.S. Cl. 414—495 **10 Claims**



1. In an aircraft loader having an elevatable platform section with underlying scissor beams, an improved hydraulic lifting means comprising:

a first movable transverse support having a pair of support guide means mounted at outboard ends of said first transverse support;

a second movable transverse support having a plurality of hydraulic cylinders mounted thereto including a pair of hydraulic cylinders, each of said pair mounted for vertical displacement at outboard ends of said second transverse support, and a single hydraulic cylinder having a piston rod end mounted for vertical displacement in the center of said second movable transverse support, said pair of hydraulic cylinders having piston rod ends oppositely directed from the piston rod end of the single cylinder mounted to said first movable transverse support;

first flexible support means carried on said piston rod end of said single hydraulic cylinder of said second transverse support, said flexible support means having one end thereof fixedly connected to said second moveable transverse support and a second end of said flexible support means fixedly connected to said elevatable platform;

second flexible support means guided by said pair of support guide means of said first transverse support, said second flexible support means having one end thereof grounded to said aircraft loader and having a second end thereof fixedly mounted to said second moveable transverse support;

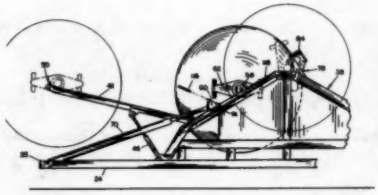
guide frame means carried by said aircraft loader for guiding said transverse supports as they move vertically upon actuation of said first pair and said single hydraulic cylinder.

4,701,098

CABLE WHEEL HANDLING AND TRANSPORTING TRAILER

Joseph W. Bills, and William D. Moller, both of Mitchell, S. Dak., assignors to Dakota Mfg. Co., Inc., Mitchell, S. Dak.

Filed Sep. 26, 1986, Ser. No. 911,920
Int. Cl.[4] B60P *1/48*
U.S. Cl. 414—502 **10 Claims**



1. A cable reel handling and transporting trailer, comprising,

a wheeled frame means including first and second laterally spaced-apart longitudinally extending side frames having rearward and forward ends, and a front frame extending between the forward ends of said side frames,

a wheel member rotatably mounted on each of said side frames,

a hitch means positioned forwardly of said front frame adapted to be connected to a prime mover,

first and second elongated leveling arms having rearward and forward ends,

said first and second leveling arms being pivotally secured at their forward ends to said first and second side frames respectively intermediate the lengths thereof,

first and second hydraulic cylinders connected to said first and second leveling arms for pivotally raising and lowering the rearward ends thereof with respect to said side frames respectively,

said first and second side frames having first and second elongated guide rails mounted thereon respectively which extend upwardly and forwardly from the forward ends of said first and second leveling arms respectively,

a cable reel spindle adapted to be extended through the hub of a cable reel, said spindle having opposite ends,

said spindle having spaced-apart first and second rollers mounted thereon,

said first roller adapted to roll upon said first leveling arm and said first guide rail,

said second roller adapted to roll upon said second leveling arm and said second guide rail,

a third hydraulic cylinder, having a base end and a rod end, pivotally connected at its base end, to said first side frame adjacent the rearward end thereof and extending forwardly therefrom, the rod end of said third hydraulic cylinder being positioned adjacent the forward end of said

first leveling arm when said third hydraulic cylinder is in its substantially retracted position,

a fourth hydraulic cylinder, having a base end and a rod end, pivotally connected at its base end, to said second side frame adjacent the rearward end thereof and extending forwardly therefrom, the rod end of said fourth hydraulic cylinder being positioned adjacent the forward end of said second leveling arm when said fourth hydraulic cylinder is in its substantially retracted position,

the extension of said first and second hydraulic cylinders causing the rearward ends of said leveling arms to be raised to a position above the forward ends thereof so that said first and second rollers will roll forwardly on said leveling arms when said spindle is positioned thereon,

spindle engaging means on the rod ends of said third and fourth hydraulic cylinders for selective engagement with the ends of said spindle whereby extension of said third and fourth hydraulic cylinders will move said spindle upwardly and forwardly on said first and second guide rails respectively,

first means at the upper end of said first guide rail for rotatably receiving said first roller,

second means at the upper end of said second guide rail for rotatably receiving said second roller,

power means on one of said side frames for rotating said spindle,

and control means for operating said hydraulic cylinders.

4,701,099

APPARATUS FOR RECOVERING AND TOWING A VEHICLE

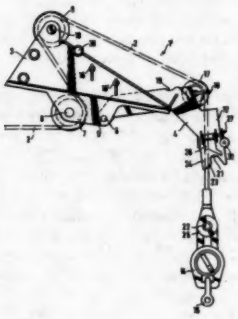
Karl-Heinz Müller, Steinen, Fed. Rep. of Germany, assignor to Rotzler GmbH & Co., Steinen, Fed. Rep. of Germany

Filed Nov. 27, 1985, Ser. No. 802,858

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1984, 3443110

Int. Cl.[4] B66C *1/68, 23/36, 23/82*

U.S. Cl. 414—563 **12 Claims**



1. An apparatus for recovering and towing a vehicle, with said apparatus being provided on a truck that has a winch with a draw cable; said apparatus comprises:

a crane that includes a frame, which is connected to said truck, a boom, which is pivotably connected to said frame, and a lifting bracket, which is connectable to a vehicle that is to be recovered and/or towed;

coupling means for detachably connecting said draw cable to said boom;

a substantially horizontally extending shaft connected to said frame and said boom, at a location remote from said coupling means, to effect said pivotable connection of said boom to said frame; said lifting bracket being operatively associated with said draw cable and said boom in such a way that said lifting bracket can be raised and lowered; said boom being adapted to be pivoted between a raised position and a lowered position;

locking pin means disposed on said frame, in the region between said coupling means and said substantially horizontally extending shaft, for locking said boom at least in said raised position;

two spaced-apart guide pulleys, with said draw cable being guided around said pulleys in an approximately S-shaped manner;

said lifting bracket being secured to said draw cable; and said coupling means comprising: a C-shaped stop recess means formed on said boom on a portion of the latter remote from said substantially horizontally extending shaft, and a coupling pin connected to said lifting bracket; when said draw cable is drawn in, said coupling pin engages in said stop recess means, said frame being made triangular with an upper corner, one of said guide pulleys having an axis of rotation in the upper corner of said triangular frame whereby a lower part of said draw cable passes over the other of said guide pulleys and leads directly to said winch on the truck and an upper end of said draw cable leads to said coupling means.

4,701,100

INDUSTRIAL ROBOT

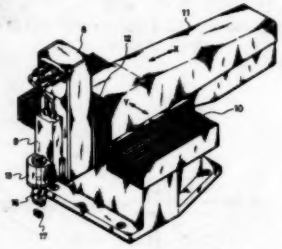
Masahide Nagai; Minoru Noda, and Hitoshi Suzuki, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Aug. 9, 1985, Ser. No. 764,676

Claims priority, application Japan, Aug. 15, 1984, 59-124454[U]; Aug. 21, 1984, 59-126560[U]

Int. Cl.[4] B25J *9/02*

U.S. Cl. 414—751 **9 Claims**



1. An industrial robot of the cartesian coordinate type comprising: a base having a first pair of rails provided on opposite sides of the base and extending along a first transfer movement direction; an intermediary base slidably mounted on said base and having first bearing means slidably engaging with said first rails; second bearing means provided on said intermediary base along a second transfer movement direction orthogonal to said first transfer movement direction; a slider slidably mounted on said intermediary base and having a pair of second rails slidably engaged with said second bearing means, the slider having an extremity portion remote from the intermediary base and extending along the second transfer movement direction, said slider being composed of a smaller specific weight material than that of said second rails and having stepped portions provided on the lower side thereof in which are mounted the second rails, and an auxiliary plate composed of a material with about the same heat expansion rate as that of said second rails and provided on the upper side of said slider opposite to the lower side of the slider; a support member mounted on the extremity portion of the slider; and a gripping member attached to the support member for releasably gripping a workpiece.

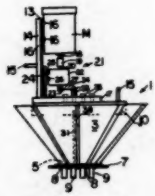
4,701,101
MODULAR MULTI-TUBE CATALYST LOADING FUNNEL

Paul C. Sapoff, Louisville, Ky., assignor to Catalyst Technology, Inc., Buckner, Ky.

Division of Ser. No. 588,985, Mar. 13, 1984, abandoned. This application Oct. 21, 1985, Ser. No. 789,753

Int. Cl.[4] B01J *4/00*

U.S. Cl. 414—786 **13 Claims**



1. A process for the simultaneous loading of a plurality of tubes of a catalytic reactor at a uniform catalyst drop rate, utilizing a multi-tube catalyst loading funnel, equipped with a plurality of hoppers, with tubular outlets, each hopper having a rotatable metering rod mounted therein, which comprises the steps of:

A. adjusting the length of the metering rod so as to be identical for each of the hoppers;

B. adjusting the speed of rotation of the metering rods so as to be identical for each of the hoppers,

C. inserting the tubes from said multi-tube hopper into the tubes of the catalytic reactor to be loaded;

D. adding a given volume of catalyst pellets to each of the hoppers;

E. controlling the catalyst drop rate of the catalyst pellets into the tubes of the reactor;

F. moving the multi-tube funnel and tubes to an adjacent set of tubes in the reactor;

G. filling each of the hoppers with a given amount of catalyst and repeating the fill operation;

H. measuring the depth of fill of the filled tubes;

I. capping the filled tubes.

4,701,102
STATIONARY BLADE ASSEMBLY FOR A STEAM TURBINE

Frank A. Pisz, Titusville, Fla., and William S. Agliano, West Chester, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 30, 1985, Ser. No. 760,385

Int. Cl.[4] F10D *9/04*

U.S. Cl. 415—136 **2 Claims**

1. A stationary blade assembly for a steam turbine having a rotor, said assembly comprising:

an arcuate bar extending generally 180°;

an array of stationary airfoil-shaped blades extending radially inwardly from the arcuate bar;

a plurality of arcuate shroud segments disposed on the radially inner end of the blades;

the arcuate shroud segments generally extending 180° and each shroud segment having a circumferentially-extending groove disposed on its radially inner side;

the grooves in each segment being aligned to generally form a continuous groove

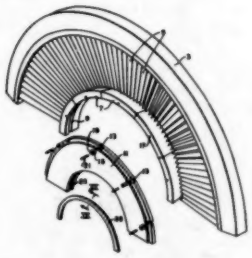
an arcuate plate extending generally 180°, the radially outer edge of the arcuate plate being received by the grooves in the shroud segments;

the arcuate plate having a plurality of kerfs disposed in its radially outer edge;

a plurality of keys slidably received by the kerfs;

pins extending into said shroud segments and through said keys for fixing the keys in the circumferential grooves in the shroud segments;

wherein the arcuate plate is held in place within the continuous groove but is free to expand due to thermal gradients without transmitting stresses to the shroud segments and the blade assembly and at the same time maintaining concentricity with the rotor.



4,701,103
TURBOMACHINE HOUSING

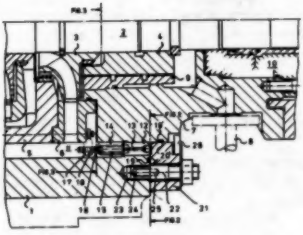
Stephen Medgvesy, Andelfingen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 5, 1985, Ser. No. 708,521

Claims priority, application Switzerland, Mar. 19, 1984, 1370/84

Int. Cl.[4] F01D *25/24*

U.S. Cl. 415—219 C **4 Claims**



1. In combination,

a turbomachine housing an open end defining a cavity for receiving turbomachine components and a plurality of radially inwardly directed teeth circumferentially spaced at said end;

a cover disposed within said open end of said housing to close said cavity, said cover having a plurality of radially outwardly directed teeth coaxially abutting said teeth of said housing;

a flange ring circumferentially surrounding said cover and secured to said end of said housing;

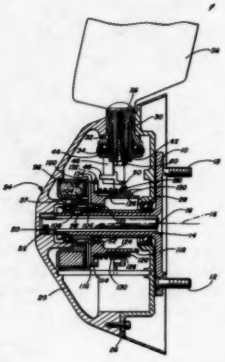
a sealing means between said ring and said housing; and

an sealing means between said ring and said cover.

4,701,104
RAM AIR TURBINE

Modehy Cohen, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 18, 1986, Ser. No. 875,460
Int. Cl.[4] F01D *7/02*
U.S. Cl. 416—44 **9 Claims**



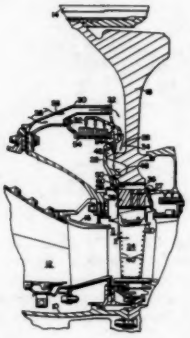
1. A ram air turbine comprising
a hub rotatable about an axis;
a plurality of blades journalled on said hub for rotation between feathered, coarse pitch and fine pitch positions;
a reciprocating to rotary motion converting mechanism connected to said blades;
means, including a flyweight assembly, for controlling the pitch of said blades between said coarse and fine pitch positions to achieve a desired rotational rate of said hub by providing a reciprocating input to said mechanism; and
means for controlling the pitch of said blades to and from said feathered position and including a brake, a selectively operable control for engaging or disengaging said brake, a rotatable screw connected to said mechanism to provide a reciprocating input thereto upon rotation of said screw, said brake, when engaged, resisting rotation of said screw, and means including a torsional/compression spring interconnecting said screw and said mechanism for providing (a) a reciprocating input to said mechanism and for (b) rotating said screw.

4,701,105
ANTI-ROTATION FEATURE FOR A TURBINE ROTOR FACEPLATE

Eugene Cantor, and Thomas A. Farrand, both of Glastonbury, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 10, 1986, Ser. No. 837,968
Int. Cl.[4] F01D *5/18, 5/32*
U.S. Cl. 416—95 **4 Claims**

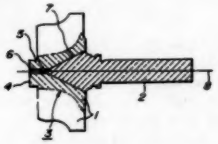
1. An air cooled, rotating turbine stage assembly, comprising:
a turbine rotor disk including a plurality of circumferentially shouldered slots disposed about the outer periphery thereof;
a plurality of turbine blades, each including a radially inwardly disposed attachment portion, the attachment portion being slidably receivable within a corresponding disk shouldered slot for engaging the blade and the disk;
a faceplate axially secured to the disk by a plurality of cooperating hooked members extending axially between the faceplate and the disk, the disk and faceplate cooperatively defining a plurality of closed airflow paths intermediate the hooked members for directing an annular flow of compressed cooling air radially outward to the internal airflow passages of the blades;
a plurality of tabs, each integral with a corresponding turbine blade and extending axially therefrom, the tab being receivable within a corresponding recess in the faceplate when the faceplate and disk are in a desired relative angular orientation;
a plurality of support lugs extending axially in opposite directions between the faceplate and the disk, the corresponding lugs contacting radially for transferring rotationally induced radial forces from the faceplate to the disk; and
wherein each engaged hooked member, faceplate recess, shouldered slot, and blade tab is disposed along one of a plurality of angularly uniformly spaced radial lines with each other corresponding engaged hooked member, faceplate recess, shouldered slot, and tab, thereby distributing rotationally induced forces throughout the disk.



4,701,106
RADIAL-TYPE CERAMIC TURBINE ROTOR AND A METHOD FOR PRODUCING THE SAME

Shingo Sasaki, Kuwana, Japan, assignor to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 681,318, Dec. 13, 1984, abandoned.
This application Jun. 11, 1986, Ser. No. 873,850
Claims priority, application Japan, Dec. 27, 1983, 58-251881
Int. Cl.[4] F01D *5/34*
U.S. Cl. 416—241 B **3 Claims**



1. A radial-type ceramic turbine rotor, comprising:
a blade portion having a front surface, a rear surface, a completely smooth conical female surface between said front and rear surfaces and an axial hole extending from said front surface toward said rear surface, said axial hole having a diameter of 2–5 mm and thereby functioning as an exhaust hole during a dewaxing of the rotor; and
a shaft portion having a completely smooth conical male surface which is complementary to said conical female surface and a tip portion at an end of said shaft portion, said tip portion having a radius of curvature of 2–5 mm,

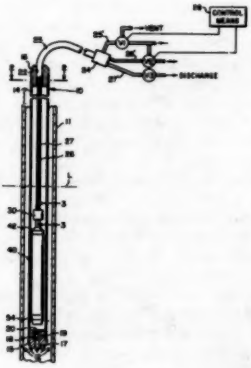
said shaft portion being bonded to said blade portion such that said conical male surface contacts said conical female surface and said tip portion is the only portion of said shaft portion which communicates with said axial hole and said tip portion is located completely within said blade portion such that said tip portion does not extend to said front surface of said blade portion.

4,701,107

TWO STAGE PUMP SAMPLER

W. David Dickinson, Medina, N.Y., and Charles N. Baetz, Ann Arbor, Mich., assignors to American Sigma, Inc., Middleport, N.Y.

Filed Apr. 4, 1986, Ser. No. 848,243
Int. Cl.[4] F04B *23/14, 43/08;* F04F *1/06*
U.S. Cl. 417—86 18 Claims



1. A two-stage pump, comprising

a first pump housing having a first check valve in one end thereof disposed to be immersed in a supply of liquid,

a second pump housing mounted in said first pump housing in spaced relation thereto, and having a second check valve in one end thereof,

said spaced relation providing a space between said first pump housing and said second pump housing,

a movable, fluid-operated pumping element in said second housing operatively dividing the interior thereof into first and second chambers, respectively,

said pumping element comprising a flexible bladder enclosing said first chamber and being separated from the inner surface of said second housing by said second chamber,

said first check valve being operable to permit liquid to flow unidirectionally therethrough from said supply to said space between said housings, and said second check valve being operative to permit liquid to flow unidirectionally therethrough from said space between the housings to said first chamber in said second housing,

a first conduit connecting said first chamber to the exterior of said housings,

a second conduit for connecting said space between said housings to a supply of fluid under pressure for use in forcing liquid from said space between the housings and successively through said second check valve, said first chamber and said first conduit to the exterior of said housings, and

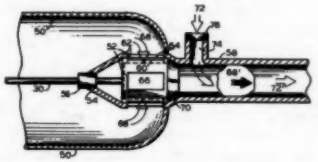
a third conduit for connecting said second chamber to said supply of fluid under pressure for use in operating said pumping element, thereby first to draw liquid into said first chamber from said space, and then to pump the last-named liquid through said first conduit to the exterior of said housings.

4,701,108

VARIABLE VOLUME EJECTOR WITH MOTIVE FLUID PULSER

Daniel Scampini, 64B Woodhollow, Twin Lakes Apts., Clifton Park, N.Y. 12065

Continuation-in-part of Ser. No. 732,657, May 10, 1985, abandoned. This application May 19, 1986, Ser. No. 864,308
Int. Cl.[4] F04F *11/00, 5/48*
U.S. Cl. 417—104 2 Claims



1. A fluid ejector comprising:

a body having an essentially cylindrical chamber therethrough for the purpose of transporting therethrough a motive fluid and a fluid which is to be ejected and further comprising an inlet chamber having a plurality of opposing apertures, a suction chamber having an induction port and an ejector chamber therein;

a source of high pressure liquid fluid for induction into said inlet chamber said source physically enveloping the apertures of said inlet chamber;

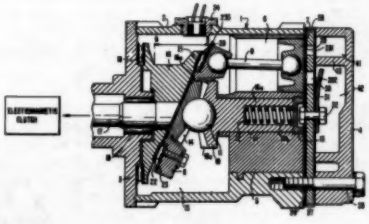
a means contained by said inlet chamber for pulsing said motive fluid prior to its passage into said suction chamber, said means further comprising a rotating cylinder having apertures which periodically align with said apertures of said inlet chamber, whereby said high pressure motive fluid when inducted into said inlet chamber is caused to form hydraulic slugs which travel through said inlet chamber, through said suction chamber and thence into and through said ejector chamber, entering and capturing quanta of fluid to be ejected which enters at said induction port from said suction chamber and, by their momentum, carrying said quanta through said ejector chamber.

4,701,109

COMPRESSOR WITH ROTATION DETECTING DEVICE

Tamotsu Daikohara, Shin, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Apr. 11, 1986, Ser. No. 850,554
Claims priority, application Japan, Apr. 11, 1985, 60-52733[U]
Int. Cl.[4] F04B *49/00, 1/14*
U.S. Cl. 417—223 1 Claim



1. A rotation detecting device for a refrigerating compressor including a housing, a drive shaft rotatably supported in said housing, an electromagnetic clutch mounted on said compressor housing for selectively coupling said drive shaft to an

external driving source, a cam rotor drivingly coupled to said drive shaft, a wobble plate disposed proximate the surface of the rotor and means for preventing rotation of said wobble plate so that the wobble plate nutates during movement of said cam rotor, comprising:

a rear thrust race disposed on the surface of said wobble plate and receiving the magnetic flux leaking from said electromagnetic clutch, said rear thrust race having a projecting portion; and

a magnetic pickup disposed on said housing and located thereon opposite a locus of movement of said projecting portion, said magnetic pickup detecting the magnetic flux density at successive passes of the projecting portion during movement of the wobble plate.

4,701,110

SWASH-PLATE TYPE ROTARY COMPRESSOR WITH DRIVE SHAFT, LUBRICATION

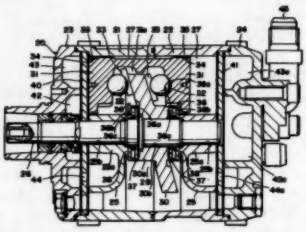
Takeo Iijima, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 19, 1986, Ser. No. 865,079

Claims priority, application Japan, May 20, 1985, 60-107137

Int. Cl.[4] **F04B** *1/16;* **F16J** *10/02;* **F01M** *1/06*

U.S. Cl. 417—269 **6 Claims**



1. A swash-plate type rotary compressor comprising:

a housing;

a drive shaft rotatably mounted in said housing;

cylinder blocks disposed within said housing, each of said cylinder blocks having formed therein a plurality of cylinder bores arranged around an axis of said drive shaft in circumferentially spaced relation to each other and having respective axes extending substantially parallel to the axis of said drive shaft;

a plurality of pistons fitted respectively in said cylinder bores for reciprocating motion therein;

a swash plate including a first hub having end faces and a first central bore, the swash plate being mounted on said drive shaft for rotation therewith so that said first central bore in said first hub is fitted on said drive shaft, said swash plate being engaged by said pistons;

wherein rotation of said swash plate causes said pistons to be reciprocated in said cylinder bores to draw fluid and compress same;

said cylinder blocks being formed of an aluminum alloy containing 16 to 20 weight % of silicon;

wherein each of said cylinder blocks includes a second hub having a second central bore;

said drive shaft being fitted within the second central bore in the second hub of each of said cylinder blocks so that a radial load exerted by said drive shaft is directly borne by an inner peripheral surface of said second central bore in the second hub of each of said cylinder blocks,

the compressor including an oil passageway for supplying lubricating oil to a clearance between an outer peripheral surface of said drive shaft and the inner peripheral surface of said second central bore in the second hub of each of said cylinder blocks; and

wherein said oil passageway comprises a plurality of annular grooves formed in the inner peripheral surface of said second central bore in said second hub of each of said cylinder blocks, and spaced from each other axially of said drive shaft, and an axial groove extending axially of said drive shaft and through said annular grooves to communicate said annular grooves with each other, said axial groove having one end opening into an end face of the second hub of the corresponding cylinder block.

2. A swash-plate type rotary compressor, comprising:

a housing;

a drive shaft rotatably mounted in said housing;

cylinder blocks disposed within said housing, each of said cylinder blocks having a plurality of cylinder bores arranged around an axis of said drive shaft in circumferentially spaced relation to one another and having respective axes extending substantially parallel to the axis of said drive shaft;

a plurality of pistons fitted respectively in said cylinder bores for reciprocating motion therein;

a swash plate including a first hub having end faces and a first central bore, the swash plate being mounted on said drive shaft for rotation therewith so that first central bore in said first hub is fitted on said drive shaft, said swash plate being engaged by said pistons;

wherein rotation of said swash plate causes said pistons to be reciprocated in said cylinder bores to draw fluid and compress same;

said cylinder blocks being formed of an aluminum alloy containing 16 to 20 weight % of silicon;

a first annular bearing surface projecting integrally from each of the end faces of said hub of said swash plate;

each of said cylinder blocks including a second hub having a second central bore;

a pair of thrust bearings each disposed between a corresponding first annular bearing surface and an end face of the second hub of a corresponding cylinder block;

said drive shaft being fitted within the second central bore in the seocnd hub of each of said cylinder blocks so that a radial load exerted by said drive shaft is directly borne by the inner peripheral surface of said second central bore in the second hub of each of said cylinder blocks;

the compressor including an oil passageway for supplying lubricating oil to a clearance between the inner peripheral surface of said second central bore in said second hub of each of said cylinder blocks and the outer peripheral surface of said drive shaft, and to a sliding portion of a corresponding thrust bearing;

a second annular bearing surface projecting integrally from the end face of said second hub of each of said cylinder blocks, for supporting a corresponding thrust bearing such that thrust load exerted by said drive shaft is directly borne by the second annular bearing surfaces of the cylinder blocks; and

wherein said oil passageway comprises an annular groove formed in the outer peripheral surface of said drive shaft and extending circumferentially thereof and a helical groove formed in the outer peripheral surface of said drive shaft in communication with said annular groove and helically extending in a direction opposite to the rotating direction of said drive shaft.

3. A swash-plate type rotary compressor, comprising:

a housing;

a drive shaft rotatably mounted in said housing;

cylinder blocks disposed within said housing, each of said cylinder blocks having formed therein a plurality of cylinder bores arranged around an axis of said drive shaft in circumferentially spaced relation to each other and having respective axes extending substantially parallel to the axis of said drive shaft;

a plurality of pistons fitted respectively in said cylinder bores for reciprocating motion therein;

a swash plate including a first hub having end faces and a first central bore, the swash plate being mounted on said drive shaft for rotation therewith so that said first central

bore in said first hub is fitted on said drive shaft, said swash plate being engaged by said pistons;

wherein rotation of said swash plate causes said pistons to be reciprocated in said cylinder bores to draw fluid and compress same;

said cylinder blocks being formed of an aluminum alloy containing 16 to 20 weight % of silicon;

a first annular bearing surface projecting integrally from each of the end faces of aid hub of said swash plate;

each of said cylinder blocks including a second hub having a second central bore;

a pair of thrust bearings each disposed between a corresponding first annular bearing surface and an end face of the second hub of a corresponding cylinder block;

said drive shaft being fitted within the second central bore in the second hub of each of said cylinder blocks so that a radial load exerted by said drive shaft is directly borne by the inner peripheral surface of said second central bore in the second hub of each of said cylinder blocks;

the compressor including an oil passageway for supplying lubricating oil to a clearance between the inner peripheral surface of said second central bore in said second hub of each of said cylinder blocks and the outer peripheral surface of said drive shaft, and to a sliding portion of a corresponding thrust bearing; and

a second annular bearing surface projecting integrally from the end face of said second hub of each of said cylinder blocks. for supporting a corresponding thurst bearing such that thrust load exerted by said drive shaft is directly borne by the second annular bearing surfaces of the cylinder blocks;

wherein said oil passageway comprises a first annular groove formed in a portion of the outer peripheral surface of said drive shaft which is axially spaced from a corresponding thrust bearing away from said swash plate, a second annular groove formed in as portion of the outer peripheral surface of said drive shaft which is located opposite to the sliding portion of a corresponding thrust bearing, and a groove formed in the outer peripheral surface of said drive shaft and extending axially thereof to communicate said first and said second annular grooves with one another.

4,701,111

REGULATION OF VANE PUMPS

Günther Seidl, Heubach, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

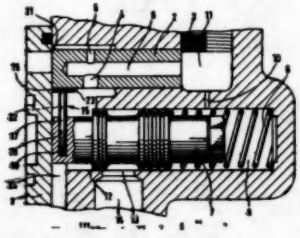
PCT No. PCT/EP85/00332, § 371 Date Mar. 6, 1986, § 102(e) Date Mar. 6, 1986, PCT Pub. No. WO86/00671, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 6, 1985, Ser. No. 849,504

Claims priority, application Luxembourg, Jul. 12, 1984, PCT/EP84/00214

Int. Cl.[4] F04B *49/00*; G05D *11/00*

U.S. Cl. 417—300 **18 Claims**



1. In a device for regulating the output of a vane pump of the kind wherein a pressure operated piston has one face exposed to outlet pressure of a vane pump and an opposite face exposed to servomotor pressure wherein the position of the piston is responsive to differential pressure on the piston faces, and including a bypass passage wherein outlet pressure flow of the pump can return to the pump inlet or be blocked therefrom dependent on piston position;

the improvement which comprises means (2) having a choke bore (4) and an outlet passage (6) for pump flow to a consumer;

said choke bore communicating between said outlet passage and said one face of said piston exposed to pump outlet pressure and being axially perpendicular to the axis of said piston;

a choke plate (16) carried by said piston to move longitudinally therewith and disposed to slidably cross over said choke bore transversely of the axis thereof to closr or open said choke bore responsive to differential pressure on the faces of said piston.

4,701,112

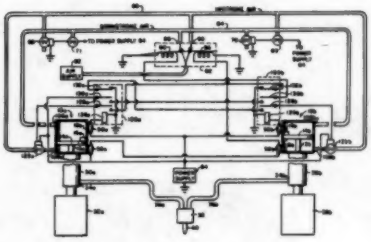
PUMPING SYSTEM

Wolfgang O. Eisenhut, Woodside, and John W. Senf, San Carlos, both of Calif., assignors to Adhesive Engineering Company, San Carlos, Calif.

Filed Oct. 2, 1986, Ser. No. 914,711

Int. Cl.[4] F04B *17/00, 35/00*

U.S. Cl. 417—345 **1 Claim**



1. A multiple fluid pumping system comprising

a first component pump comprising

a first fluid reservoir,

a first fluid positive displacement pump in fluid communication with said first fluid reservoir,

a first pneumatic piston and cylinder combination, said first piston connected to said first positive displacement pump,

means for detecting the top-of-stroke position of said first piston,

means for detecting the bottom-of-stroke position of said first piston,

a second component pump comprising

a second fluid reservoir,

a second fluid positive displacement pump in fluid communication with said second fluid reservoir,

a second pneumatic piston and cylinder combination, said second piston connected to said second positive displacement pump,

means for detecting the top-of-stroke position of said second piston,

means for detecting the bottom-of-stroke position of said second piston,

a pneumatic two-position valve having an air inlet port, a first outlet port in fluid communication with the upper end of said first and second cylinders and a second outlet port in fluid communication with the lower end of said first and second cylinders,

an air supply in fluid communication with said inlet port of said pneumatic two-position valve,

means for actuating said pneumatic two-position valve to

fluidly communicate said inlet port of said valve with said first outlet port of said valve when both of said means for detecting the top-of-stroke position of said first piston and said means for detecting the top-of-stroke position of said second piston have concurrently detected the top-of-stroke of their respective pistons, and

means for actuating said pneumatic two-position valve to fluidly communicate said inlet port of said valve with said second outlet port of said valve when both of said means for detecting the bottom-of-stroke position of said first piston and said means for detecting the bottom-of-stroke of said second piston have concurrently detected the bottom-of-stroke of their respective pistons, and

means for preventing reverse travel of the piston first to reach the end of its stroke until the other piston has reached the end of its stroke.

4,701,113

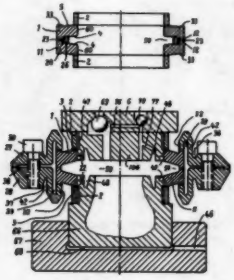
PUMP ARRANGEMENT WHICH INCLUDES A WORKING CHAMBER WHICH IS BORDERED BY A CONED RING WITH A SEAL LIP ON THE INNER FACE OF THE CONED RING

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 282,990, Jul. 14, 1981, Pat. No. 4,557,347, and a continuation-in-part of Ser. No. 387,567, Jun. 11, 1982, Pat. No. 4,569,630. This application Oct. 16, 1985, Ser. No. 788,174

Int. Cl.[4] **F04B** *43/00;* **F01B** *19/00*

U.S. Cl. 417—472 **2 Claims**



1. A pump including a fluid containing chamber (50) provided with inlet and outlet valves (69,70) and formed between at least one hollow coned ring element (1,11) and at least one closing wall portion (6,7,66,1,11) with said hollow coned ring and said chamber subjected to periodic axial compression and expansion by an arrangement which includes a reciprocating piston 66 which at least indirectly meets at least one of said coned rings and subjects said coned rings and said chamber to said compression and expansion with an improvement, wherein said improvement consists in the provision of a pair of said hollow coned ring elements (1,11) with said coned rings symmetrically arranged around a common axis to form between said hollow coned rings said chamber (50) with a clamping ring arrangement provided radially outwards of said coned ring to fasten the radial outer ends of said coned rings together, wherein said clamping rings (27,28) form radially flexible ring shaped portions (42) radially inwards of circular ring grooves (29) to meet with the holding faces of said portions (42) clamping faces (33) on the radial outer ends of said coned rings (1,11); and, wherein said coned rings (1,11) are provided with axially towards the other of said rings (1,11) directed outer axial extensions (12) with said extensions (12) formed with bearing faces (13) which meet each other in a bearing face pair (23), while a centering ring (20) meets the radial inner faces of said extensions (12) to center said coned rings (1,11) on each other while a seal ring (26) is provided raidally inwards of said centering ring (20) to seal said chamber (50).

4,701,114

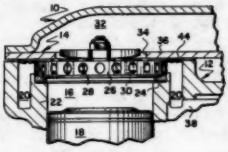
COMPRESSOR SUCTION GAS HEAT SHIELD

Garry E. Andersen, La Crosse; James R. Quinn, Coon Valley, and Peter J. Linnert, La Crosse, all of Wis., assignors to American Standard Inc., New York, N.Y.

Filed Jul. 25, 1986, Ser. No. 889,042

Int. Cl.[4] **F16L** *59/00;* **F04B** *39/12*

U.S. Cl. 417—564 **13 Claims**



1. Aparatus in a refrigeration compressor comprising:

a cylinder block having a surface in which a void is defined;

a cylinder head assembly having a surface at least partially abutting said surface of said cylinder block, said abutting surface of said cylinder head assembly including an area which overlies said void in said surface of said cylinder block, said overlying area of said cylinder head assembly being at a temperature higher than the temperature in said void in said first machine part when said machine is in operation; and

unitary means, disposed between said cylinder block and said cylinder head assembly, for both defining a dead space, in cooperation with said cylinder head assembly, between said void in said cylinder block and said overlying area in said cylinder head assembly and for providing a seal between the directly abutting surfaces of said cylinder block and said cylinder head assembly.

4,701,115

AXIAL SEALING MECHANISM FOR A SCROLL COMPRESSOR

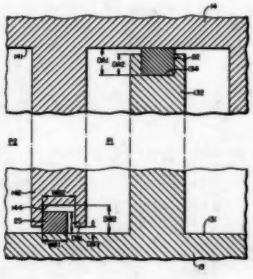
Shigemi Shimizu, Sakai, and Jiro Iizuka, Takasaki, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Dec. 30, 1985, Ser. No. 814,791

Claims priority, application Japan, Jan. 28, 1985, 60-9031[U]

Int. Cl.[4] **F04C** *18/04, 27/00*

U.S. Cl. 418—55 **1 Claim**



1. In a scroll type fluid displacement compressor including a housing, a pair of scrolls, one of said scrolls fixedly disposed relative to said housing and having an end plate from which a

first scroll element extends into the interior of said housing and the other scroll movably disposed for non-rotative orbital motion within the interior of said housing and having an end plate from which a second scroll element extends, said first and second scroll elements interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets and drive means operatively connected to said other scroll to effect the orbital motion of said other scroll and said line contacts, the improvement comprising:

a groove formed on the axial end surface opposite said end plate of each of said first and second scroll elements;

a first seal element disposed in a first groove, said first seal element having an axial thickness equal to or greater than the depth of said first groove and a width substantially equal to the width of said first groove; and

a second seal element disposed in a second groove, said second seal element having an axial thickness less than the distance between the bottom surface of said second groove and the end plate of the opposing scroll wherein the width of the second seal element is less than the width of said second groove so that said second seal element is movable in an axial direction within said second groove in response to the fluid pressure of the fluid pockets within said scroll.

4,701,116

EXTRUSION DIE FOR A BLOW HEAD FOR MAKING BLOWN PLASTIC FILMS

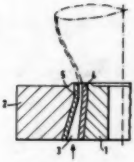
Fritz Achelpohl; Gerhard Winkler, both of Lengerich; Hermann Tüpker, Westerkapeln, and Jürgen Linkies, Hagen, all of Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Sep. 27, 1985, Ser. No. 780,846

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1984, 8430508[U]

Int. Cl.⁴ B29C *47/08, 47/12*

U.S. Cl. 425—72 R **5 Claims**



1. An extrusion die for a blow head for making blown plastic films comprising inner and outer rings, which are made of steel, and define between them an annular orifice, characterized in that the entire surfaces of the inner and outer rings which define the die orifice are covered by a layer consisting of a metallic material having a thermal conductivity of about 0.7 cal/(cm×s×degree) to obtain a uniform temperature profile in both axial and peripheral directions.

4,701,117

APPARATUS FOR JOINTING CV CABLES

Michio Takaoka, Chiba; Tsuneaki Motai, Yachiyo; Motoyuki Ono, Sakura; Isao Kaji, Ichikawa; Masakazu Hasegawa, Funabashi; Masayuki Tan, Chiba, and Masaru Kurata, Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Apr. 14, 1986, Ser. No. 851,777

Int. Cl.⁴ B29C *45/03, 45/66*

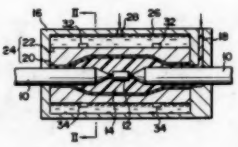
U.S. Cl. 425—116 **21 Claims**

1. An apparatus for jointing cables, comprising:

a single mold for receiving therein joint portions of CV cables which are to be jointed together and for molding an insulating member for covering said joint portions of said cables to be jointed together, said mold being provided with a split portion along the axial direction thereof, said mold being openable at said split portion along said axial direction;

a lock mechanism mounted on said split portion of said mold for locking said split portion in a closed position to lockingly close said mold during molding of said insulating member;

said lock mechanism including means for automatically unlocking said lock mechanism to permit opening of said mold along said split portion during heating and crosslinking of said insulating member;



means for introducing an insulating material into said mold when said mold is in said locked condition for molding said insulating material around said joint portions to thereby form said insulating member;

a container for accommodating therein said mold and said lock mechanism; and

means for introducing a high-pressure fluid into said container, after said insulating material is introduced into said mold, for applying a closing force to said mold when said lock mechanism is automatically unlocked to thereby press against said insulating member during crosslinking of said insulating member.

4,701,118

APPARATUS FOR FILTERING PLASTICIZED MATERIALS IN EXTRUDERS

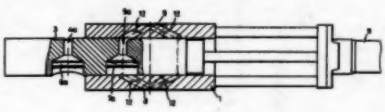
Horst Köching, and Rolf-Rüdiger Stude, both of Münster, Fed. Rep. of Germany, assignors to Kreyenborg Verwaltungen und Beteiligungen KG, Münster-Kinderhaus, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 864,081

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1985, 3523743

Int. Cl.⁴ B29C *47/68*

U.S. Cl. 425—185 **11 Claims**



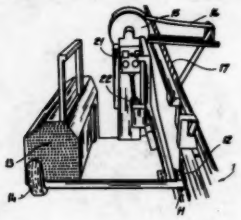
1. Apparatus for filtering a flowable synthetic plastic material in an extruder, comprising a housing having an inlet and an outlet for a stream of plastic material and at least four discrete channels connecting said inlet with said outlet; a plurality of carriers mounted in and movable relative to said housing between a plurality of different positions, each of said carriers having at least one passage which is in register with one of said discrete channels of said housing in one position of the respective carrier and is accessible in another position of the respective carrier; and filters mounetd on said carriers in said passges for filtering flowable synthetic plastic material in said passages.

4,701,119

APPARATUS FOR UNWRAPPING AND REMOVAL OF RUBBER TUBES

Giuseppe A. Colbachini, Via Fossona, 77, 35030 Cervarese S. Croce (Padova), Italy

Filed Nov. 5, 1986, Ser. No. 927,741
Claims priority, application Italy, Nov. 20, 1985, 22907 A/85
Int. Cl.[4] B29C *35/00, 43/50, 41/42*
U.S. Cl. 425—436 R 6 Claims



1. Combined apparatus for the unwrapping the bindings from a rubber tube formed on a metal core after vulcanisation thereof, and for removal of said rubber tube from said core, comprising:

a bed constituted by a plurality of conveyor belts arranged in series in a horizontal plane,

header means at each end of said bed,

carriage means movable along one side of said bed,

a spool carried by said carriage,

a drive motor for driving said spool,

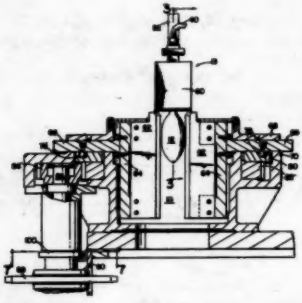
transmission means interconnecting said drive motor and said spool, said transmission means including slip means allowing slippage of the drive to said spool.

4,701,120

APPARATUS FOR FORMING ACCORDION PLEATS IN A THIN-WALLED PLASTIC CONTAINER

Wolfgang Kesselring, Goshen, Conn., assignor to Jamieson Manufacturing Company, Inc., Torrington, Conn.

Filed Jan. 6, 1986, Ser. No. 816,381
Int. Cl.[1] B29C *53/22*
U.S. Cl. 425—369 10 Claims



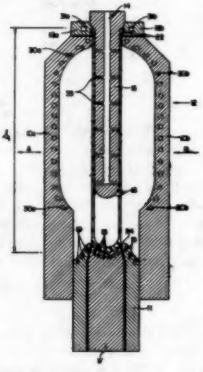
1. Apparatus for forming a circumaxially extending series of axially elongated accordion pleats in and about the sidewall of a generally cylindrical thin-walled plastic container which is closed at one end and which has a reduced diameter opposite end portion with an opening extending axially therethrough, each said container also having a radially outwardly projecting annular flange at its said reduced diameter opposite end portion, said apparatus comprising a container forming station, a container gripping and transporting means having an inwardly extending plate on its bottom for successively engaging unpleated containers about the annular flanges on their said reduced diameter opposite end portions and for transporting the same to and from the container forming station, the remaining portions of each container projecting from the gripping and transporting apparatus for introduction to and removal from said forming station, and said container gripping and transporting apparatus also including air supply and discharge conduits which enter said axially extending opening in said opposite end portion of a container, and a pressurized hot air supply source being provided for connection with said air supply line for the introduction of hot air to the interior of the containers whereby to render the containers malleable at least along their sidewalls when they are delivered to the forming station, a plurality of circumaxially arranged radially movable forming blades disposed about a container introduced to the forming station, each of said blades being elongated axially along and adjacent the sidewall of a container at the forming station, and an operating means for said forming blades adapted to cyclically and in unison move the blades radially inwardly and outwardly respectively to form accordion pleats in and around the sidewall and to release a container at the forming station, said container gripping and transporting means serving successively to introduce and to remove unpleated and pleated containers from said forming station in axial movement of the containers and in timed relationship with the radial inward and outward movement of said forming blades.

4,701,121

APPARATUS FOR PRODUCING A BIAXIALLY ORIENTED CONTAINER OF POLYETHYLENE TEREPHTHALATE OR SIMILAR MATERIAL

Kjell M. Jakobsen, Skanor, and Claes T. Nilsson, Loddeköpinge, both of Sweden, assignors to PLM AB, Malmo, Sweden

Continuation of Ser. No. 489,736, Apr. 29, 1983, abandoned, which is a division of Ser. No. 264,829, May 18, 1981, Pat. No. 4,467,929. This application May 6, 1985, Ser. No. 730,735
Claims priority, application Sweden, May 29, 1980, 8004003; Dec. 10, 1980, 8008650
Int. Cl.[4] B29C *49/00, 49/12, 49/30, 49/48*
U.S. Cl. 425—526 13 Claims



1. Apparatus for forming a container from orientable thermoplastic material comprising:

a mold having a molding cavity,

means for holding a hollow preform of thermoplastic material in said molding cavity of said mold, said preform having one end held by the holding means and including a side wall and a closed end opposite said one end, the material of said side wall having axial orientation and

being capable of circumferential expansion and circumferential orientation,

said mold including a mold body and a movable mold part in said mold body having a surface facing said closed end of the preform, said movable mold part being movable in said mold body between a retracted position and an advanced position,

means for expanding the preform in the mold cavity to form the container without any axial stretching of said side wall, the relative position of said holding means and said movable mold part in its retracted position being such that said preform, prior to its formation to the finished shape of said container, comes into contact with said movable mold part,

means for displacing said movable mold part between the retracted and advanced positions while said preform is held by said holding means and is in contact with the movable mold part; and

means for controlling the displacing of said movable mold part from said retracted to said advanced position while the preform is being expanded to coordinate the displacement of the movable mold part with the expanding of the preform such that the material of the side wall is not stretched in a plane perpendicular to the direction of expanding and thereby the material does not undergo any axial strain due to elongation and said expanding produces circumferential stretching and circumferential orientation of the material in said side wall independent of and superimposed on said axial orientation,

said means for expanding the preform comprising a blow mandrel projecting within said cavity to support said preform and secured in stationary relation in said mold, said blow mandrel projecting a substantial distance in said cavity and having an end spaced from the movable part in its retracted position so that the preform extends from the holding means onto said mandrel and beyond said end of the mandrel towards said movable mold part in its retracted position prior to said expanding of the preform,

said end of the mandrel being substantially adjacent to the movable mold part in the advanced position thereof.

4,701,122

PRESSING TOOL FOR PRODUCING DISH-SHAPED PRESSED OBJECTS, IN PARTICULAR PLATES, CUPS, BOWLS, ETC., OF POWDERS, PREFERABLY CERAMIC MATERIAL

Heinrich Reimche, Garmisch-Partenkirchen, Fed. Rep. of Germany, assignor to Dorst Maschinen- und Anlagenbau, Otto Dorst und Dipl.-Ing. Walter Schlegel GmbH & Co., Fed. Rep. of Germany

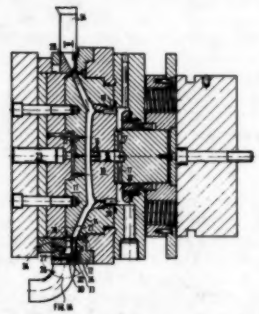
Filed Mar. 28, 1986, Ser. No. 845,449

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1985, 3512852

Int. Cl.[4] B28B 7/00

U.S. Cl. 425—584 **7 Claims**

1. A pressing tool for producing dish-shaped pressed objects of powdery material, including a die and a counterdie whose front surfaces facing each other form the upper and lower sides of the dish-shaped pressed object when the powdery material filled in therebetween is pressed, the die and the counterdie being adapted to move toward each other comprising: an annular element supported on the die or counterdie and the powdery material being filled into a space limited by the front surfaces of the die and counterdie, said annular element having a connection for the feeding of material and at least one vacuum connection means, and said annular element being displaceable relative to the die and counterdie in their direction of movement toward each other, and at least one of the rims of the front surfaces of the die and counterdie protruding in an annular shape toward the rim of the other front surface, and the die and counterdie being adapted to move toward each other only so far as to leave a small axial annular gap between the rims of their front surfaces, wherein the axially protruding annular rim is supported on the corresponding die by an axially directed outer projection on which the annular element is displaceable; said vacuum connection means being axially offset with respect to an axial annular gap defined on the rim of



the die and counterdie when the pressing tool is closed; and said vacuum connection further being in communication with said annular gap via at least one annular clearance.

4,701,123

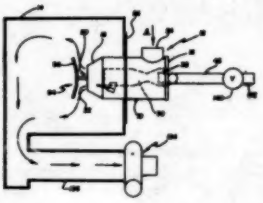
GAS FUEL BURNER

William R. Tallman, Huntington, and Robert A. Kaplan, Fort Wayne, both of Ind., assignors to The Scott & Fetzer Company, Fort Wayne, Ind.

Filed Dec. 24, 1986, Ser. No. 946,304

Int. Cl.[4] F23M 9/06

U.S. Cl. 431—171 **12 Claims**



1. A flame spreader apparatus for use with a burner including an opening wherethrough flames from within the burner exit, said flame spreader apparatus comprising:

a flame spreader;

a stem portion connected to said flame spreader;

a plurality of leg portions, each leg portion adapted for connecting to said burner at one end thereof and meeting with at least one other respective leg portion at the other end thereof; and

wherein said stem portion is mounted to said meeting of said leg portions whereby said flame spreader can distribute flames coming out of the burner.

9. A fuel burner apparatus comprising:

a heat exchanger having a circular inlet and an outlet;

a fuel burner having a cylindrical burner body with an air inlet and a flame opening;

a ring member receiving therethrough and connected to said cylindrical burner body, said burner body also received within said heat exchanger circular inlet with said flame opening in said heat exchanger and said air inlet outside of said heat exchanger, said ring member connected to said heat exchanger thereby connecting said fuel burner to said heat exchanger;

a flame spreader apparatus including a flame spreader, a stem portion connected to said flame spreader, a plurality of leg portions connected to said burner body at one end thereof and meeting with at least one other respective leg portion at the other end thereof, and wherein said stem portion is mounted to said meeting of said leg portions whereby said flame spreader can distribute flames coming out of the burner flame opening; and

draft inducing means connected to said fuel burner apparatus for forcing air through said fuel burner air inlet, through said fuel burner and heat exchanger and out through said heat exchanger outlet.

4,701,124

COMBUSTION CHAMBER APPARATUS FOR COMBUSTION INSTALLATIONS, ESPECIALLY FOR COMBUSTION CHAMBERS OF GAS TURBINE INSTALLATIONS, AND A METHOD OF OPERATING THE SAME

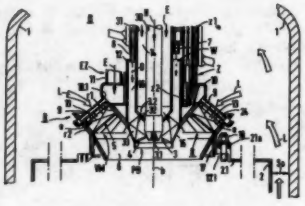
Helmut Maghon, and Bernard Becker, both of Mülheim/Ruhr, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Mar. 4, 1986, Ser. No. 836,232

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1985, 3507516

Int. Cl.[4] F23Q *9/00*

U.S. Cl. 431—284 **14 Claims**



1. In a combustion chamber having a substantially cylindrical housing and a flame tube with an end face, the flame tube being thermally movable and centered in the combustion chamber and the flame tube being spaced from the cylindrical housing defining an annular gap therebetween, the improvement comprising a burner apparatus having a burner axis and including at least one pilot burner having a head and being disposed in the vicinity of the end face of the flame tube for generating a pilot flame, said pilot burner operating with at least one fuel from the group consisting of natural gas and heating oil, an air supply channel surrounding said head, a premixing device for the combustion of natural gas in the form of a ring channel system surrounding said head, said ring channel system including flow conduction walls defining an inflow cross section at an air inflow side of said ring channel system being open toward the annular gap for conducting a majority of available combustion air in a given flow direction from the annular gap to a combustion zone developing downstream of said burner head in the flame tube, the combustion air having flow vectors with components entering said combustion zone in directions ranging from parallel to said burner axis to an acute angle relative to said burner axis, said combustion air components having swirl components superimposed thereon tangentially relative to said burner axis, using said burner axis as a swirl center, a multiplicity of nozzle tubes penetrating said inflow cross section in a direction substantially transverse to said given flow direction, said nozzle tubes each having ends and having a side with nozzle openings facing away from said air inflow side of said ring channel system, and a natural gas feeding system substantially concentrically surrounding said pilot burner and being connected to one of said ends of each of said nozzle tubes.

4,701,125

THERMAL METHOD FOR DESTRUCTION OF MICROFILM PRODUCTS

Judith F. Kitchens, Haymarket; Carl H. Culp, Sr., Vienna; Raymond G. Hyde, Fairfax County, all of Va., and Shirley G. Brownlee, Greenbelt, Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 10, 1980, Ser. No. 158,418

Int. Cl.[4] F27B *14/00*

U.S. Cl. 432—1 **2 Claims**

1. A method for the pyrolytic destruction of microform products which comprises the steps of:

a. placing said microform products in a suitable container;

b. placing silicone oil within a storage container positioned adjacent to said microform products;

c. preheating said silicone oil to a temperature of between 100° to 150° C.;

d. rupturing said silicone oil containing storage container to combine said preheated silicone oil with said microform products;

e. further heating the combination of said preheated silicone oil and said microform products to a temperature of about 250° C. for a period of about five minutes to effect the pyrolysis of said microform products.

4,701,126

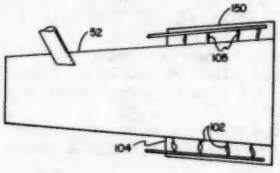
ELEVATED TEMPERATURE DEHYDRATION SECTION FOR PARTICLE DRYING PULSE JET COMBUSTION SYSTEMS

Robert R. Gray, 7110 Via Monte Mar, Gladstone, Oreg. 97027, and Thomas G. Lindahl, 7325 SW. Mallard Ct., Portland, Oreg. 97223

Filed Oct. 3, 1985, Ser. No. 783,856

Int. Cl.[4] F27B *15/00*; B01D *1/16*; F23C *11/04*; F27D *7/00*

U.S. Cl. 432—58 **4 Claims**



1. In pulse jet combustor apparatus for the drying of particulate material of the type having

a combustion chamber,

an air inlet conduit connected to one end thereof

a primary exhaust gas outlet conduit connected to the other end thereof,

an elongated transition-tailpipe section connected to said primary exhaust conduit, and

a frusto-conically shaped drying section of increasing diameter connected to the downstream end of said transition-tailpipe section having means for introducing particulate material to be dried therein,

the improvement comprising

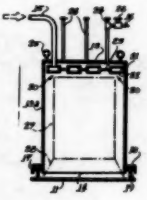
means for maintaining the surfaces of the downstream end of said frusto-conical drying section exposed to said particulate material at an elevated temperature through localized selective application of heat thereto to reduce particulate stickage on such surfaces.

4,701,127

CONTROLLED ATMOSPHERE CAPSULE FOR FLUXLESS BRAZING

Kostas F. Dockus, Cicero, and John L. Zambrow, Lincolnshire, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 10, 1982, Ser. No. 448,562
Int. Cl.[4] F27D *1/18*; C21D *1/06*
U.S. Cl. 432—242 **4 Claims**



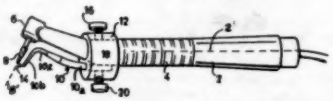
1. An apparatus for use in brazing comprising an open-bottom, box-like container having a closed end and integral sidewalls, an end plate covering said open bottom, foil gasket sealing means disposed between said end plate and the periphery of said open bottom, at least one diffusion plate disposed within the interior of said container adjacent said closed end and a gas inlet tube connected to said closed end and communicating with said diffusion plate.

4,701,128

HANDHELD GRINDING DEVICE FOR CROWN PREPARATION

Simon Fitzig, 68 Ibn Gvirol Street, and Ervin Weiss, 18 Kley Street, both of Tel-Aviv, Israel

Filed Dec. 19, 1985, Ser. No. 810,583
Claims priority, application Israel, Jan. 4, 1985, 74003
Int. Cl.[4] A61C *1/16*
U.S. Cl. 433—116 **11 Claims**



1. A handheld grinding device particularly useful as a dental tool for crown preparation including a handle and a grinding burr rotatable about a rotary axis, characterized in that said device further includes a guard having a stem attachable to said handle, said stem including an inner mounting section and an outer section of a solid cylindrical configuration extending laterally of and generally parallel to the rotary axis of the grinding burr, said outer section of the stem terminating in a solid spherical tip closely spaced from the tip of the grinding burr such as to be receivable between a tooth to be prepared and the free gingival tissue thereat to protect the gingival tissue during the grinding of the tooth.

4,701,129

FACE SHIELD DEVICE

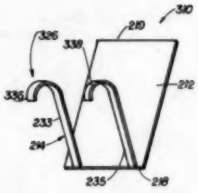
James T. Hazard, 311 Fairmeade Rd., Louisville, Ky. 40207

Filed Mar. 24, 1986, Ser. No. 842,824
Int. Cl.[4] A61C *5/14*
U.S. Cl. 433—136 **14 Claims**

9. A face shield device comprising:

a transparent face shielding panel; and,

a pair of spaced apart rigid straps joined at their lower ends to the face shield panel proximate the lower edge of the face shield panel, said joining of the straps to the lower end of the face shield panel proximate the lower edge thereof being the sole means of support between said face shield panel and said straps, the straps being adapted to lay



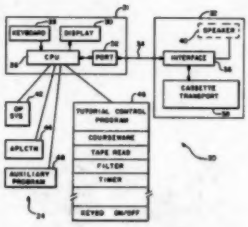
on the wearer's chest and holding the face shielding panel in front of and spaced outwardly from the wearer's face and eyes only, said face panel will not extend around the sides of the wearer's head.

4,701,130

SOFTWARE TRAINING SYSTEM

David R. Whitney, Burlingame, and Ronald B. Whitney, San Carlos, both of Calif., assignors to Access Learning Technology Corporation, San Mateo, Calif.

Continuation of Ser. No. 690,785, Jan. 11, 1985, Pat. No. 4,637,797. This application Oct. 2, 1986, Ser. No. 914,797
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—118 **12 Claims**



1. A software training authoring system comprising:

(a) a computer system including central process (CPU) means for executing computer programs, and keyboard means for entering data and commands into said computer system; and

(b) recording means for recording on a multiple channel recording medium an audio signal on a first channel and keystroke data on a second channel, said audio signal and keystroke data being recorded so that both can be produced simultaneously when said recording medium is read, said audio signal including oral instructions for explaining the usage of a predefined computer program, said keystroke data including keystrokes for use as input data and commands to said predefined computer program simultaneously with the reading of the corresponding oral instructions recorded on said first channel;

said computer system further including:

(c) recording control means, including

on/off software means for activating and deactivating said recording means; and

keystroke transmission means for sending keystroke data for use in said predefined computer program to said recording means for recording on said recording medium.

4,701,131

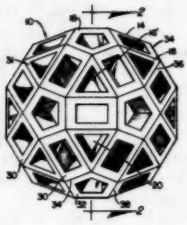
GEOMETRIC MODELING KIT AND METHOD OF MAKING SAME

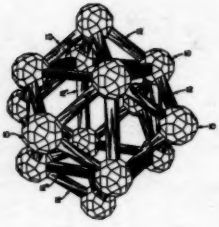
Paul R. Hildebrandt, 220 Seminole Dr., Boulder, Colo. 80303, and Marc G. Pelletier, 187 Hungry Hollow Rd., Spring Valley, N.Y. 10977

Filed Nov. 20, 1985, Ser. No. 799,791

Int. Cl.[4] G09B *23/04*

U.S. Cl. 434—211 **10 Claims**





1. A geometrical device comprising a plurality of hollow nodes and shape-coded connectors extending between said nodes, said nodes and connectors assembled into a three-dimensional, geometric figure, each node having a plurality of polygonal elements consisting of a combination of triangular, rectangular and pentagonal elements with outside edges of each polygonal element bordered by edges of adjacent polygonal elements, each element having an opening therethrough corresponding in configuration to outer side edges of each said element with each opening converging radially toward the center of each node; and

said plurality of connectors being elongated and having opposed connecting ends, each connecting end having a cross-sectional configuration corresponding to a cross-sectional configuration of an opening in one of said elements for insertion therein, the relative lengths of said connectors based on on T powers of unity where $T=\sqrt{3}/2+\frac{1}{2}$.

4,701,132

DUMMY FOR CAR CRASH TESTING

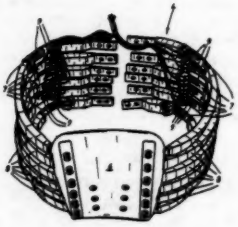
Lothar Groesch; Gabriel Netzer, both of Stuttgart, and Lothar Kassing, Nufringen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktieng..sellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 3, 1986, Ser. No. 825,353

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1985, 3503577

Int. Cl.[4] G09B *23/32*

U.S. Cl. 434—274 **19 Claims**



1. An anatomical model for simulating the effect of an accident on a human body comprising:

a skeleton member having a thorax area;

a front plate member disposed in said thorax area;

a plurality of pairs of spring rib members simulating human ribs, each pair of spring rib members being disposed on opposite sides of said front plate member, each pair of spring rib members including a back spine area opposite said front plate member; and

a plurality of sensor means, each of said pairs of spring rib members including at least one separate sensor means attached thereto near said back spine area for sensing a force applied to each individual pair of spring rib members.

4,701,133

HERMAPHRODITIC CONNECTOR

Sidney V. Worth, Flourtown, Pa., assignor to Continental-Wirt Electronics Corporation, Southampton, Pa.

Filed Jan. 21, 1987, Ser. No. 5,705

Int. Cl.[4] H01R *13/28, 25/00, 39/00*

U.S. Cl. 439—13 **22 Claims**

1. In an electrical connector comprising a pair of body members, each of said body members including:

plural spaced-apart ribs;

means for releasably securing said body members together with their ribs interleaved to define respective spaces between immediately adjacent interleaved ribs, said releasably securable means enabling said members to pivot through a predetermined angular range about a longitudinal axis extending through said interleaved ribs; and plural electrical contacts, wherein each of said contacts includes:

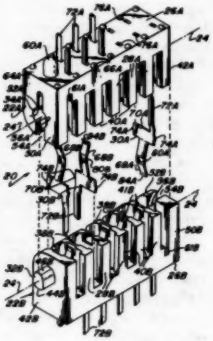
a post section extending out of said body member; an intermediate section connected to said post section; and an elongated cantilever section projecting from said body

member in a direction towards said longitudinal axis so that when said members are secured together, the cantilever section of each contact of one member is disposed within a respective one of said spaces along with the cantilever section of a corresponding contact of the other member;

an improvement comprising:

(A) said intermediate section of said contacts comprises an anchoring section secured to said body member; and

(B) said cantilever section of each of said contacts includes a free end portion, an intermediate portion defining an



engagement surface, and an arm portion, said arm portion supporting said engagement surface at a position contiguous with said longitudinal axis, said free end portion and arm portion of said cantilever section being arranged to readily flex to facilitate the securement of said body members together, whereupon the engagement surfaces of the contacts of one body member engage the corresponding engagement surfaces of the contacts of the other body member in good electrical contact therebetween irrespective of the angular orientation of one body member to the other in said angular range.

4,701,134

ELECTRICAL CONNECTOR PROVIDING SWITCHABLE CONNECTIONS BETWEEN ELEMENTS

Graeme P. Jones, Springfield, England, assignor to Polyhitech, Bedfordshire, England

PCT No. PCT/GB85/00381, § 371 Date Apr. 16, 1986, § 102(e) Date Apr. 16, 1986, PCT Pub. No. WO86/01674, PCT Pub. Date Mar. 13, 1986

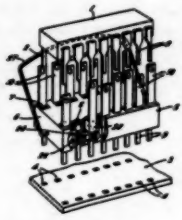
PCT Filed Aug. 23, 1985, Ser. No. 852,836

Claims priority, application United Kingdom, Aug. 24, 1984, 8421549

Int. Cl.⁴ H01R *29/00*

U.S. Cl. 439—43 **1 Claim**

1. An electrical connector device for use in providing switchable electrical connections between respective terminals of two circuit elements, the device comprising a unitary housing of electrically insulating material carrying a plurality of first socket terminals open to one face of the housing for receipt of terminals of a first circuit element, and carrying a plurality of second terminals projecting from a second face of the housing opposite to said one face for connection to the second circuit element, and a plurality of individually operable switching elements, each having an associated conductive portion which projects beyond said one face of the housing and each being selectively operable between a conductive state providing an electrical connection between said conductive portion and respective first and second terminals, a first non-conductive state in which said conductive portion is connected only to the associated first socket terminal, and a second non-



conductive state in which said conductive portion is connected only to the associated second terminal.

4,701,135

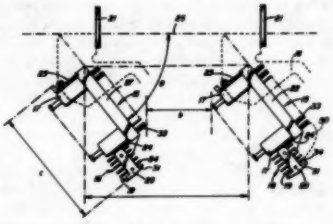
HIGH DENSITY CONNECTOR FOR MAIN FRAMES IN TELEPHONE SYSTEMS

Thomas G. Volk, Highland Park, and Donald F. Jaycox, Deerfield, both of Ill., assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 785,733, Oct. 9, 1985, abandoned. This application May 15, 1986, Ser. No. 863,510

Int. Cl.⁴ H05K *7/14*

U.S. Cl. 439—54 **53 Claims**



1. A connector for main frames in telephone systems, comprising:

an elongate rectangular body portion of shallow rectangular cross-section viewed along a vertical axis, said body portion including a front face and a plurality of mounting positions on said front face for mounting a plurality of protector modules, said mounting positions being in columns and rows;

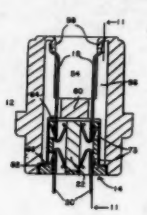
a jumper field positioned at one side of said body portion, said jumper field including a plurality of jumper connecting terminals, said terminals arranged in columns and rows;

a bracket for mounting said body portion and jumper field on a vertical frame member, said bracket including a back member disposed in a single plane and upper and lower flange members extending forwardly normal to the back member, said body portion and said jumper field extending between and attached to said flange members; means in said back member positioned between said upper and lower flange members for mounting said bracket on said frame member, the arrangement such that said body portion extends in a plane at a predetermined angle relative to the plane of the frame member, said predetermined angle being between about 50 degrees and 75 degrees.

4,701,136
ELECTRICAL CONNECTOR COMPONENT

John N. Madeley, Worksop, England, assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 21, 1986, Ser. No. 820,056
Claims priority, application United Kingdom, Feb. 15, 1985, 8503880
Int. Cl.[4] H01R *11/20*
U.S. Cl. 439—76 11 Claims



1. An electrical multiple-way connector component adapted to receive a circuit board comprising:

a first array of connector component-engaging contactors disposed in parallel relation to one another and arranged at a first pitch;

a second array of discrete cable engaging terminals disposed in parallel relationship to one another for engaging wire-type conductors of a flexible cable and arranged at a second pitch, said first and second pitches being of a different dimension from each other and the contactors of said first array being offset from the terminals of said second array;

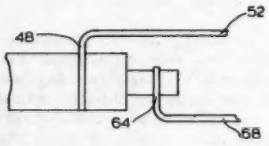
housing means formed with slot means therein, said slot means for removably retaining said contactors and said terminals in said connector component;

circuit board means removably assembled to both said arrays and providing on at least one surface thereof spaced conductive electrical pathways for electrically interconnecting the array of contactors at one pitch with the array of terminals at a different pitch, the array of said terminals being arranged to electrically engage portions of said wire-type conductors of said flexible cable that extend substantially perpendicular to the plane of the circuit board means; and said housing means receiving said circuit board means whereby a reduced length of conductive paths is provided between said arrays.

4,701,137
ELECTRICAL CONNECTOR FOR COAXIAL CABLES

Robert DeRoss, Naperville, Ill., assignor to Molex Incorporated, Lisle, Ill.

Continuation of Ser. No. 596,861, Apr. 4, 1986, abandoned. This application Jan. 6, 1986, Ser. No. 800,882
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—394 2 Claims



1. An electrical commoning connector for electrically commoning first and second coaxial cables,

each coaxial cable having a central conductor, an inner dielectric insulating layer surrounding said central conductor, an outer conductor coaxially disposed with respect to said central conductor and surrounding said inner dielectric insulating layer and an outer dielectric insulating layer surrounding said outer conductor, at least one of said coaxial cables having a prepared end wherein a predetermined length of said outer dielectric insulating layer and a predetermined length of said outer conductor is removed from one longitudinal end thereof to expose a bared connecting portion formed by a predetermined length of said central conductor surrounded by a predetermined length of said inner dielectric insulating layer,

the elactical connector including a central terminal arrangement for electrically commoning the central conductors of each cable, an outer terminal arrangement for electrically commoning the outer conductors of each cable, and means for electrically insulating said central and outer terminal arrangements from each other,

wherein the improvement comprises:

both of said cables having said prepared end;

said central terminal arrangement including an integral stamped first terminal member having a plurality of end plate portions each including inuslation displacing slot means for electrically connecting one of said coaxial cable center conductors;

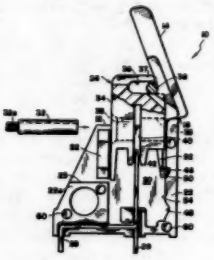
said outer terminal arrangement comprising an integral stamped second terminal member having a plurality of end plate portions each including insulation displacing slot means for electrically connecting one of said coaxial cable outer conductors immediately adjacent said prepared cable end thereof;

said connector including opposing dielectric base and cover members, said base member mounting said first terminal member and dimensioned to overlie said first terminal member and said cover member mounting said second terminal member and dimensioned to overlie said second terminal member and said base member and matingly engaging said base member so as to align opposed pairs of insulation displacing slot means taken one from each of said first and said second terminal members and to enclose said first and said second terminal members and said prepared ends of said coaxial cables.

4,701,138
SOLDERLESS ELECTRICAL CONNECTOR

Edward H. Key, Hummelstown, Pa., assignor to Phoenix Terminal Blocks Inc., Middletown, Pa.

Filed Dec. 18, 1986, Ser. No. 943,087
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—417 11 Claims



1. In a solderless connector for an insulated wire, having a body with an opening and a lever covering the opening and hingedly connected to the body and movable between an open position wherein the opening is uncoverd and a closed position wherein the opening is covered, the improvement comprising:

an electrical conductive terminal mounted in the body and

having means slidably receptive of an insulated wire for electrically contacting the wire;

wire guide means having an aperture receptive of an insulated wire and slidably received in the opening in the body for movement between a disconnecting first position wherein the guide means is disposed partially outside of the body and wherein the wire can be inserted in the aperture and a connecting second position wherein the guide means is disposed in the body and the inserted wire is slidably received in the electrically connecting means of the terminal; and

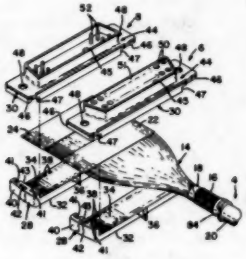
means operatively connecting the lever to the guide means to move the guide means from the disconnecting first position to the connecting second position in response to the movement of the lever from the open position to the closed position, and wherein the means connecting the lever to the guide means further includes means for moving the guide means from the connecting position to the disconnecting position in response to the movement of the lever from the closed position to the open position, whereby an inserted wire can be removed.

4,701,139

SHIELDED CABLE ASSEMBLY

Robert S. Good, Etters; Michael J. Scully, Steelton, and William E. Zelko, Dauphin, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 25, 1986, Ser. No. 856,610
Int. Cl.[4] H01R *9/07, 13/658*
U.S. Cl. 439—497 **19 Claims**



1. An electrical cable assembly comprising:

a multiple conductor cable having individual insulated conductors disposed in a planar array, said conductors uniformly spaced with respect to each other in said array;

means for securing the planar array of individual conductors at axially spaced locations;

electrical terminals of electrical connectors terminated to the respective conductors at the spaced locations; and

means for securing the electrical connectors in back-to-back orientation.

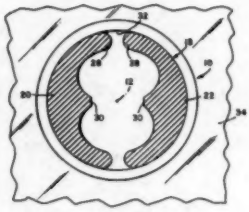
4,701,140

ELECTRICAL CONNECTOR WITH COMPLIANT SECTION

Robert S. Orbanic, Warren, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jul. 28, 1986, Ser. No. 889,723
Int. Cl.[4] H01R *13/428, 13/41*
U.S. Cl. 439—751 **4 Claims**

1. An electrical connector comprising: a body having a longitudinal axis with first and second spaced apart, substantially rigid portions separated by and joined to a compliant portion formed as a fusiform, laterally bifurcated tube providing two oppositely disposed substantially C shaped segments symmetrically arrayed about a line normal to said longitudinal axis; said substantially C shaped segments each having a first given thickness adjacent the ends thereof and a second given thickness substantially at the center thereof, said second given



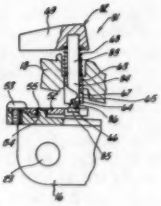
thickness being greater than said first given thickness and extending substantially the entire length of said substantially C-shaped segment.

4,701,141

STEERING DEVICE FOR AN OUTBOARD MOTOR

Yukio Sumigawa, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 749,388, Jun. 27, 1985, abandoned.
This application Jan. 13, 1987, Ser. No. 5,352
Claims priority, application Japan, Jul. 25, 1984, 59-153186
Int. Cl.[4] B63H *25/02*
U.S. Cl. 440—55 **6 Claims**



1. In a steering device for an outboard motor or the like adapted to be affixed to the transom of an associated watercraft or the like and supported for steering movement about a generally vertically extending steering axis comprising a first member adapted to be affixed to the transom, and a second member adapted to be affixed to the outboard motor, means for supporting said first and said second members for relative movement between a disengaged position wherein the motor may be steered about the steering axis and an engaged position wherein the outboard motor is held against movement about the steering axis, one of said members comprising a pin and the other of the members comprising a member defining an opening adapted to receive the pin, the pin being supported for movement into and out of engagement with the other member opening, the improvement comprising at least one of said member being frangible for fracture thereof to release the outboard motor for steering movement about the steering axis when said members are in their engaged position and when a predetermined emergency force is applied to the outboard motor to steer it.

4,701,142
PADDLE HANDLE ACCESSORY

William Merritt, 350 First Ave., New York, N.Y. 10010

Filed Sep. 19, 1985, Ser. No. 777,705
Int. Cl.[4] B63H *16/04*
U.S. Cl. 440—101 8 Claims

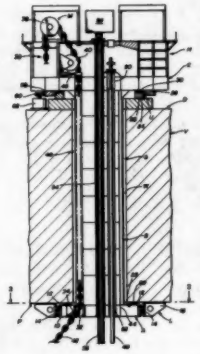
1. A paddle comprising:
a blade;
a shaft having a longitudinal axis;
said shaft being affixed at a first end thereof to an upper end of said blade;
a palm grip at a second end of said shaft;
said blade and palm grip having said longitudinal axis passing therethrough;
a handle disposed intermediate said first and second ends;
said handle including a grip inclined for general alignment with a hand of a user when paddling with said paddle, whereby paddling can be performed with a substantially straight wrist;
first means for connecting an upper end of said handle to said shaft intermediate said first and second ends;
second means for connecting a lower end of said handle to said shaft intermediate said first and second ends and closer to said first end than said first means for connecting; and
said first and second means including means for permitting said shaft to twist a substantial angular amount about said axis during said padding without said handle being rotated in the hand of the user, whereby substantially more comfortable paddling is enabled.

4,701,143
VESSEL MOORING SYSTEM AND METHOD FOR ITS INSTALLATION

Joe W. Key, Magnolia, and Fred E. Shumaker, Houston, both of Tex., assignors to Key Ocean Services, Inc., Magnolia, Tex.

Continuation-in-part of Ser. No. 661,690, Oct. 17, 1984. This application Apr. 29, 1986, Ser. No. 857,041
Int. Cl.[4] E21B *43/01*
U.S. Cl. 441—5 25 Claims

1. A method of installing a mooring system in newly constructed vessels and retrofitting into existing vessels, comprising:
installing a vertical well extending from the deck of the vessel to the bottom plates of the vessel, the ratio of the opening of the well to the width of the deck adjacent said well being in the ratio of 1:5 to 1:10,
connecting a lower bearing ring adjacent to the underside of said bottom plates said lower bearing ring circumscribing said well;
placing a lower turret unit substantially within said lower bearing ring, said lower turret unit having an annular shape with a larger cross-sectional area, in a plane perpendicular to the longitudinal axis of said well, than said well, said lower turret unit rotatably mounted to said lower bearing ring for lateral guidance and prevention of uplift of said lower turret unit in a direction from said bottom plates to said deck;
placing a middle turret unit substantially within said well;
connecting said middle turret unit to said lower turret unit;
connecting an upper bearing ring adjacent to the top of the deck, said upper bearing ring circumscribing said well; and
connecting an upper turret unit to said middle turret unit, said upper turret unit having an annular shape with a larger cross-sectional area, in a plane perpendicular to the

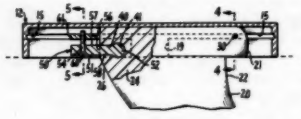


longitudinal axis of said well, than said well, said upper turret unit rotatably mounted to said upper bearing ring for lateral guidance thereof and for support of the weight of the assembly of said upper, middle and lower turret units;
whereupon the vessel can be continuously moored in seas having wave heights as great as ninety to one hundred feet.

4,701,144
BREAKAWAY SURFBOARD FIN HOLDER

Glen A. DeWitt, III, San Andreas Rd., Watsonville, Calif. 95077

Filed Mar. 13, 1986, Ser. No. 839,107
Int. Cl.[4] A63C *15/05*
U.S. Cl. 441—79 3 Claims



1. An improved surfboard fin holder for use in conjunction with a surfboard having a fin-supporting channel mounted in the lower, rear surface of the surfboard, wherein the channel has a pair of elongated grooves, the improvement comprising:
a fin having an anchoring tongue extending rearwardly along the top of said fin,
pin means carried by said anchoring tongue adapted to slidably engage said elongated grooves of said channel,
breakaway tab means carried at the forward portion of said fin, wherein said breakaway tab means comprises:
a slot formed in the upper, forward portion of said fin,

a tab removably carried by said slot, said tab extending forwardly past the forward edge of said fin, and

connecting means for detachably connecting said tab to said elongated grooves of said channel;

such that when said fin strikes an obstruction, said breakaway tab means fails at a predetermined level of force such that the fin itself is not damaged, but may be reused by insertion of a replacement tab and remounting of the forward portion of said fin in said channel.

4,701,145

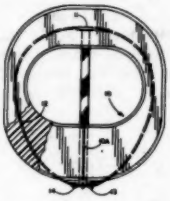
LIFE-SAVING DEVICE

Robert R. Foresman, 26902 Paseo Cardero, San Juan Capistrano, Calif. 92675

Filed Feb. 28, 1986, Ser. No. 833,804

Int. Cl.[4] B63C *9/08*

U.S. Cl. 441—131 **10 Claims**



1. A buoyant lifesaving device comprising,

a flotation element having a generally oval shape with a front portion, a rear portion, and a pair of side portions joining said front portion and said rear portion so as to define an aperture with a generally oval shape,

said flotation element front portion is a relatively larger component than each of said side portions and said rear portion individually,

said flotation element including a slit in said front portion which slit communicates with said aperture thereby to produce a pair of closely spaced ends of said front portion in juxtaposition to each other,

first strap means imbedded in each of said front, rear and side portions of said flotation element around said aperture,

second strap means having one end thereof joined to said first strap and imbedded in said rear portion of said flotation element, and

ring means having a portion thereof connected with said second strap means and partially imbedded in said rear portion and a portion thereof extending from said rear portion of said flotation element.

4,701,146

ILLUMINATED INFANT TOY

Paula S. Swenson, Golden, Colo., assignor to Neptune Corporation, Golden, Colo.

Continuation-in-part of Ser. No. 583,633, Feb. 27, 1984, Pat. No. 4,588,387. This application Jan. 3, 1986, Ser. No. 815,940

The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.

Int. Cl.[4] A63H *33/26*

U.S. Cl. 446—130 **15 Claims**

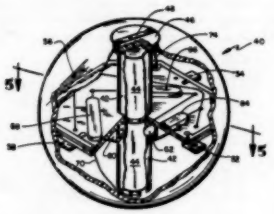
1. A hand operated toy which provides both a sound and illumination response to the user, said toy comprising:

a generally spherical housing;

a magnetic member movable along a predetermined path within said housing upon turning or rolling said housing;

a plurality of normally open reed switches mounted along said predetermined path so as to be sequentially closed each time said magnetic member moves along said path past said switches;

battery means mounted in said housing; and



a plurality of lights in said housing connected in circuit with said battery means and said switches so that at least one of said switches is closed by said magnetic member.

4,701,147

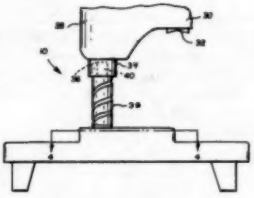
TOY SIMULATED POWER DRILL WORKSHOP

David E. Moomaw, East Aurora, assignor to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 27, 1986, Ser. No. 923,666

Int. Cl.[4] A63H *33/30*

U.S. Cl. 446—145 **12 Claims**



1. A toy simulated power drill workshop for simulating the drilling action of a real power drill in the process of drilling a hole through a board or the like, comprising:

a body member having a first opening extending therethrough;

a plate movably mounted on the body member for covering the first opening, the plate having a second opening alignable with the first opening upon movement of the plate for uncovering the first opening;

driven means mounted on the plate and having a portion thereof extending into the first opening;

a power means having drive means on the end thereof rotatable therewith, the drive means adapted when inserted and pressed into the first opening into engagement with the portion of the driven means to move the plate until the first and second openings are aligned, and then to suddenly move through the aligned first and second openings simulating the sudden movement of a real drill when it passes completely through a board or the like.

4,701,148

FILLING VALVE FOR USE IN FILLING BALLOONS

John Cotey, 27 West End Ave., Haddonfield, N.J. 08033

Filed Jul. 2, 1986, Ser. No. 881,323

Int. Cl.[4] A63H *3/06*

U.S. Cl. 446—224 **3 Claims**

1. In combination, a balloon having a neck with an opening and a valve assembly for filling the balloon positioned in said

neck, said valve comprising an elongated generally tubular body member having an upper section and a lower section divided by a transverse interior wall, a radially outwardly directed frusto-conical flange diverging downward toward the lower edge of the lower section forming a seal with the bead at the mouth of the balloon, means defining at least one port communication with the lower section and located above said flange and at least one opening in the side wall of the upper

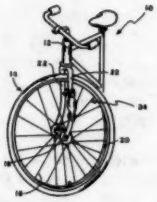
section spaced downwardly from the upper terminal edge thereof a predetermined distance, the ratio of the area of the upper opening to the lower port being about 5:1, said balloon neck snugly embracing the exterior of said valve and normally preventing flow between said lower port and upper opening and during filling defining an air chamber between said balloon neck and valve having two axially spaced annular seals between the balloon neck and said flange and upper terminal edge.

4,701,149

METHOD AND APPARATUS FOR BICYCLE NOISE MAKING SYSTEM

James J. Breil, 701 Marilyn, Glendale Heights, Ill. 60139

Filed Sep. 22, 1986, Ser. No. 910,378
Int. Cl.[4] A63H *5/00*
U.S. Cl. 446—404 **4 Claims**



1. A device for securing a balloon to a frame member of a bicycle having at least one wheel supported by spokes attached to said frame member, comprising:

a flexible, generally elongate strap having two oppositely facing sides;

one side of said strap comprising first hook and loop securement means;

the second side of said strap having a securement portion and a frame engaging portion;

said securement portion including second hook and loop securement means for cooperation with said first hook and loop securement means to secure said strap to said frame member;

said frame engaging portion including a flexible, generally elongate band member;

said band member being adapted for non-slip engagement with said frame member; and

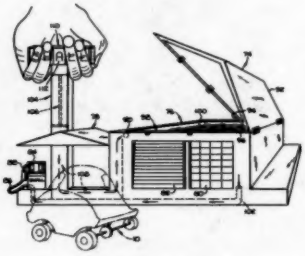
means cooperating with said band member for mounting said balloon at opposite ends thereof to said frame member and providing adjustable placement of said balloon toward and away from said spokes wherein said balloon is engaged by said spokes when said balloon is placed toward said spokes so that rotational movement of said wheel produces a given motor-type sound and wherein said means cooperating with said band member includes a reverse bent terminal end portion of said band member which grips an end portion of said balloon and which is compressed against said frame member by said frame engaging portion of said strap.

4,701,150

TOY AUTOMOBILE AND FILLING STATION SET

Jorge A. Alvarez, 1230 S. Kern Ave., Los Angeles, Calif. 90022

Filed Sep. 25, 1985, Ser. No. 780,028
Int. Cl.[4] A63H *17/44, 29/22*
U.S. Cl. 446—423 **2 Claims**



1. A toy automobile and toy filling station set comprising,

the automobile having a self-contained motor and power means for driving it,

control means for activating the power means,

a tank for holding water,

actuating means responsive to water in the tank for actuating the control means,

the filling station including a simulated gasoline pump, a simulated building having space therein including a water tank, and a roof movable between an open position exposing the water tank in the building and a closed position covering the water tank and sealable with the remainder of the filling station for sealing the water tank therein,

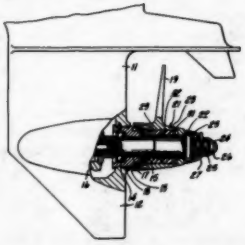
conduit means for conducting water from the water tank in the building through the simulated gasoline pump into the tank in the automobile, and a manually operatable air pump for pumping air into said space for forcing water in the water tank therein into the tank in the automobile, said air pump including a vertically standing and vertically movable actuating member including a hand gripping element at the top thereof, said element connected to said actuating member for moving said actuating member with respect to the remainder of said air pump, the actuating member of the air pump extending above the remainder of the filling station including above the gasoline pump and the remainder of the air pump, and the hand gripping element including display material viewable broadside over the remainder of the filling station.

4,701,151

PROPELLER DAMPING ARRANGEMENT FOR MARINE PROPULSION DEVICE

Hidehiko Uehara, Shizuoka, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Oct. 12, 1983, Ser. No. 541,170
Claims priority, application Japan, Oct. 13, 1982, 57-178453
Int. Cl.[4] F16D *3/76*; B63H *1/14*
U.S. Cl. 464—89 **22 Claims**



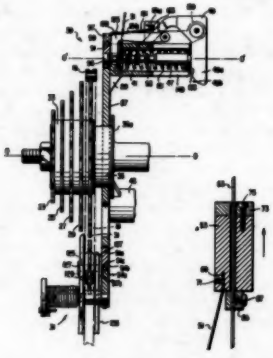
1. A coupling arrangement for drivingly connecting a propeller to a driving shaft comprising means for supporting said propeller relative to said driving shaft for movement axially in either direction and circumferentially, and resilient means interposed between said driving shaft and said propeller, a first portion of said resilient means being fixed relative to said propeller, a second portion of said resilient means being fixed relative to said driving shaft for transmission of both circumferential and axial forces in either direction between said driving shaft and said propeller, said resilient means being more resilient in a circumferential direction than in an axial direction for absorbing torsional vibrations while offering more rigid resistance to axial displacement.

4,701,152

AUTOMATIC TRANSMISSION FOR MULTI-SPEED BICYCLE

Robert Dutil, 10537 Boul. Lacroix, St. Georges, Beauce-Sud, P. Q., Canada G5Y-1K2 , and Raymond Gilbert, Range Des Pipins, La Guadaloupe, Beauce-Sud, P. Q., Canada G0M-1G0

Filed May 22, 1986, Ser. No. 865,800
Int. Cl.[4] F16H *9/24, 11/08*
U.S. Cl. 474—70 **39 Claims**



1. An automatic transmission for a linked chain driven wheel having an axis of rotation and an axle extending along said axis of rotation, where the ratio of the linear speed of the chain to the angular speed of the wheel about said axis of rotation is automatically and incrementally adjusted, said automatic transmission comprising:

(1) a plurality of chain-engaging sprockets disposed coaxially with and spaced apart along said axis of rotation of said wheel, each of said sprockets having a predetermined diameter, each of said sprockets having a diameter different from the diameter of each of the other sprockets of said plurality of chain-engaging sprockets;

(2) drive means for drivingly connecting said plurality of chain-engaging sprockets to said wheel;

(3) chain guide means, axially movable relative to said plurality of chain-engaging sprockets so as to be individually alignable with each of said sprockets in a respective plane, substantially transverse to said axis, containing a respective sprocket, for engaging said chain and guiding said chain into engagement with said respective aligned sprocket;

(4) chain guide actuating means operatively connected to said chain guide means, for varying the axial position of said chain guide means automatically in response to the angular speed of said wheel;

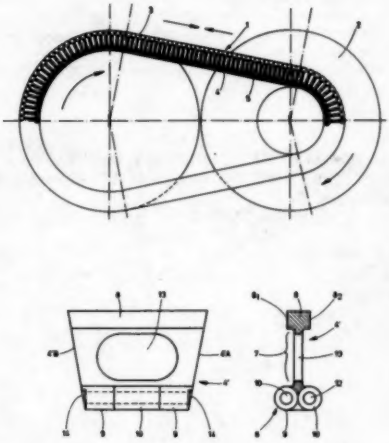
whereby on angular rotation of said wheel said chain guide means is axially moved by said chain guide actuating means to automatically guide said chain into engagement with a sprocket of a diameter in relation to the angular speed of said wheel.

4,701,153

DOUBLE-ACTION BELT INTENDED PARTICULARLY FOR A SPEED VARYING DEVICE COMPRISING PULLEYS OF VARIABLE USEFUL DIAMETER

Louis Duport, 109, rue Colbert, 92700 Colombes, France

Filed May 7, 1986, Ser. No. 860,742
Claims priority, application France, May 20, 1985, 85 07573
Int. Cl.[4] F16G *5/16*
U.S. Cl. 474—201 **4 Claims**



1. A double-action belt for a speed varying device of the kind having pulleys of variable diameter, the double-action belt comprising

(i) a plurality of rigid trapezoidal elements, each element having the base of its trapezoid parallel to a longer side, the elements being articulated one to another at their bases, each element having an opening therethrough situated substantially centrally within the trapezoid,

(ii) an elastic member extending through the central openings in the trapezoidal elements and forming a closed loop with the trapezoidal elements strung along the loop, each trapezoidal element being attached to the elastic member whereby the trapezoidal element is held captive by the elastic member, and

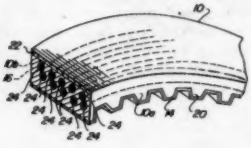
(iii) each trapezoidal element at said longer side of the trapezoid having flanges extending from the faces thereof whereby the central portions of contiguous trapezoidal elements are spaced apart by abutment of the flanges when the contiguous elements are pressed together.

4,701,154

REINFORCED BELT ASSEMBLY AND METHOD OF MANUFACTURE

Doyle W. Rausch, Niles, Mich., assignor to National Standard Company, Niles, Mich.

Filed Apr. 18, 1985, Ser. No. 724,610
Int. Cl.[4] F16G *1/28, 1/08*
U.S. Cl. 474—205 **42 Claims**



1. A reinforced belt construction comprising:

a gear-tooth engaging portion,

a reinforcing material portion positioned circumferentially about said gear-tooth engaging portion, said reinforcing material portion being in the form of a strip and comprised of a continuous elongated reinforcing member associated and positioned with respect to a carrier member such that the lateral edges of said carrier member are free of said reinforcing member, and wherein said reinforcing material portion about said gear-tooth engaging portion includes more than one circumferential wrapping of said strip, and

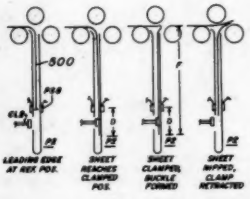
a layer of covering material positioned about said reinforcing material portion.

4,701,155

BUCKLE CHUTE FOLDER WITH CLAMP

Robert S. Ott, Dublin, Pa., assignor to R. Funk & Co., Inc., Doylestown, Pa.

Filed Jul. 11, 1986, Ser. No. 884,475
Int. Cl.[4] B65H *45/14*
U.S. Cl. 493—14 **9 Claims**



1. In apparatus for folding a sheet of paper-like material along a selected one of a variety of possible folding lines, comprising a sheet-receiving pocket, means for feeding said sheet along a path leading to and entering into said pocket, sheet arresting means for arresting the advance of said sheet into said pocket at a controllable position while said feeding means continues to feed said sheet into said pocket to cause said sheet to buckle outside the entrance to said pocket, and means adjacent said entrance operative upon arrest of said advance for grasping the buckled portion of said sheet external to and adjacent to the entrance to said pocket to form a fold line, and for withdrawing said sheet from said path and said pocket, the position of which fold line depends upon how far said sheet has advanced into said pocket before being arrested, the improvement wherein:

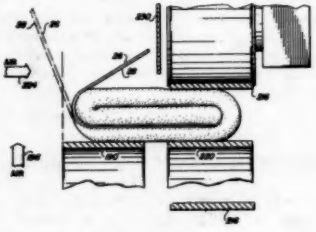
said sheet arresting means comprises sheet clamping means positioned adjacent to said pocket and actuatable to bear against and clamp said sheet momentarily at a location between the leading and trailing edges thereof with respect to said pocket and thereby momentarily arrest its advance into said pocket; and control means for controlling said clamping means to vary the position of the sheet in said pocket at which said clamping means is actuated to arrest said sheet, thereby to control the position on said sheet of the fold line.

4,701,156

METHOD AND APPARATUS FOR FABRICATING THREE-FOLD PADS

Lionel M. Larsonneur, Pomona, Calif., assignor to Paper-Pak Products, Inc., La Verne, Calif.

Continuation of Ser. No. 427,165, Sep. 29, 1982, abandoned. This application Mar. 21, 1986, Ser. No. 842,546
Int. Cl.[4] B31F *1/00*
U.S. Cl. 493—418 **19 Claims**



1. A method for folding an obstetrical pad having a central body portion and first and second end portions at opposite ends of the central body portion, the two end portions having corresponding tail portions extending therefrom, respectively, comprising the steps of:

delivering an unfolded pad to the input of a series of drive means;

accepting said unfolded pad and driving said pad through first and second sequences of operating stations;

folding the first end portion of said pad transversely as it passes through said first sequence of operating stations to position approximately one-third of the pad in substantially parallel juxtaposition along the central body portion of the pad;

folding the second end portion of said pad transversely around the end of said first end portion and the tail portion extending therefrom as the pad passes through the second sequence of operating stations to position approximately one-third of the pad at said second end portion in substantially parallel juxtaposition with the folded first end portion and central body portion, wherein the second end portion overlaps said first end portion and associated tail portion;

leading a tail portion from said first end portion outwardly between the overlapped end portions to the exterior of the folded pad; and

compressing the folded pad in preparation for packaging to

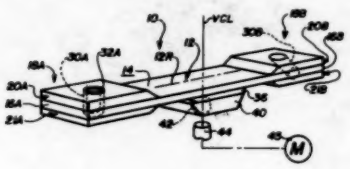
provide a compressed folded pad having three pad layers and two transverse folds with both tail portions accessible from outside the folded pad.

4,701,157

LAMINATED ARM COMPOSITE CENTRIFUGE ROTOR

Raymond G. Potter, Southbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 19, 1986, Ser. No. 897,813
Int. Cl.[4] B04B 5/02
U.S. Cl. 494—16 40 Claims



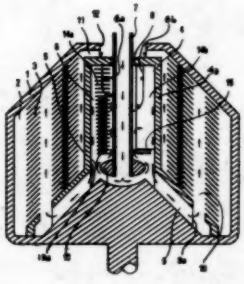
1. A centrifuge rotor comprising an arm, the arm having a base portion formed from a plurality of laminae each of which is itself formed of fibers in a resin matrix, the base portion having an enlarged load distribution region at each end thereof, each enlarged region being formed from a stack of laminae with each lamina being itself formed of a plurality of fibers in a resin matrix, each enlarged region having means for carrying a sample.

4,701,158

CENTRIFUGAL SEPARATOR

Claes Inge, Saltsjoe-Duvnaes; Torgny Lagerstedt, Stockholm; Leonard Borgstroem, Bandhagen; Claes-Goeran Carlsson, Tullinge; Sven-Olof Naebo, Tyresoe; Hans Moberg, Stockholm, and Peter Franzen, Tullinge, all of Sweden, assignors to Alfa-Laval Separation AB, Tumba, Sweden

Filed Oct. 23, 1986, Ser. No. 922,392
Claims priority, application Sweden, Oct. 30, 1985, 8505128
Int. Cl.[4] B04B 1/08
U.S. Cl. 494—74 8 Claims



1. A centrifugal separator having a rotor, a separating chamber in said rotor, a stationary inlet tube for supplying liquid to the rotor, means forming a central receiving chamber within the rotor, said receiving chamber comprising a receiving compartment and an induction compartment, means forming several channels distributed around the rotor axis and connecting the receiving chamber with the separating chamber, induction members for causing liquid supplied thereto to rotate with the rotor before entering said channels, said stationary inlet tube extending into the receiving chamber and having a discharge opening situated in the receiving compartment, said induction members being arranged to induce rotation of liquid supplied to the receiving chamber substantially within said induction compartment, said induction compartment surrounding the stationary inlet tube, and the receiving compartment being free of members effecting substantial rotation of liquid therein,

and a deflecting member extending around the inlet tube, there being at least one passage between the deflecting member and the inlet tube, said deflecting member forming a partition between parts of said receiving and induction compartments situated at the same radial level;

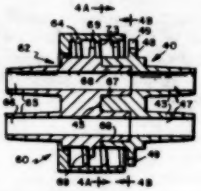
at least the main part of said induction members being located in said induction compartment at a level radially outside of said passage or passages between the deflecting member and the inlet tube.

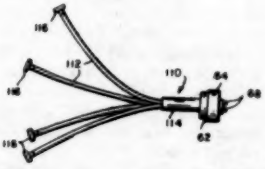
4,701,159

MULTILUMEN CATHETER SET

Eric W. Brown, Redondo Beach, and Henry T. Tai, Pacific Palisades, both of Calif., assignors to I-Flow Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 678,481, Dec. 5, 1984, Pat. No. 4,581,012. This application Nov. 7, 1985, Ser. No. 795,906
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—43 17 Claims





1. A multilumen catheter set comprising:

a first lock adapter including a plurality of conduits providing communication between a plurality of openings in a front face of said first lock adapter and a plurality of ports in a rear face of said first lock adapter;

a multilumen catheter;

a second lock adapter having a plurality of conduits in communication with the lumens of said multilumen catheter;

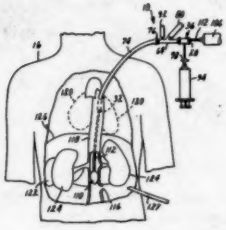
means for locking said first lock adapter to said second lock adapter, said locking means being operable to put the conduits of said second lock adapter in communication through the front face of said first lock adapter with the conduits of said first lock adapter; and

at least one independent single lumen access line each having one end connecting to one of said ports.

4,701,160
CATHETER AND METHOD FOR INFUSING FLUID INTO A PATIENT

Erin J. Lindsay, Manchester, Mich., and John N. Pittman, Carmel, Ind., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 11, 1986, Ser. No. 872,936
Int. Cl.[4] A61M 31/00
U.S. Cl. 604—53 4 Claims



3. A method of infusing blood into a patient to increase the blood pressure of the patient upstream of an aortic rupture, said method comprising the steps of:

A. providing a medical catheter suitable for use with an occlusion catheter for infusing fluid into a patient, said occlusion catheter having an inlet opening, an expandable occluder and a passageway therebetween, said medical catheter comprising:

1. a first inlet opening;
2. a second inlet opening spaced a distance from said first inlet opening;
3. an outlet opening;
4. a passageway connecting said openings, said first inlet opening, said outlet opening and said passageway being dimensioned to receive said occlusion catheter; and
5. valve means between said first and second inlet openings for controlling the size of a portion of said passageway therebetween to close said passageway and close said passageway around said occlusion catheter, when said occlusion catheter is received within said portion of said passageway, to restrain the passage of fluid through said first inlet opening;

B. inserting said medical catheter directly into said patient's aorta;

C. infusing blood directly into said aorta through said second inlet opening of said medical catheter to raise said blood pressure before opening said patient's abdomen;

D. inserting said occlusion catheter into said medical catheter through said first inlet opening of said medical catheter;

E. extending said expandable occluder of said occlusion catheter into said aorta upstream of said aortic rupture; and

F. expanding said occluder to restrain the flow of said blood within said aorta past said occluder, whereby a portion of the cardiovascular system upstream of said aortic rupture is isolated from a portion of the cardiovascular system downstream of said aortic rupture, so that said patient's abdomen can be opened with decreased risk of loss of said blood pressure.

4,701,161
METHOD AND APPARATUS FOR INSEMINATION IN VIVO AND IN VITRO

Lucien-Charles Lenck, 34, Rue Marechal de Lattre de Tassigny, 63000 Clermont Ferrand, France

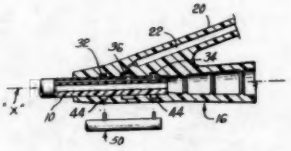
Filed Apr. 23, 1986, Ser. No. 854,883
Claims priority, application France, Apr. 24, 1985, 85 06516
Int. Cl.[4] A61F 2/04; A61M 25/00
U.S. Cl. 604—55 11 Claims

1. A device for carrying out in-vitro/in-vivo fertilization in a procedure in which a passage is perforated through the uterine wall in a host mother, said device comprising a balloon-like culture container for receiving an oocyte and its follicular liquid removed from a mother, spermatozoa and a culture medium, and a relatively rigid neck attached to said container and communicating therewith, said neck being insertable in said passage and having a length substantially equal to the thickness of the wall, said neck being provided on its outside with means serving to resist sliding of the neck along said passage.

4,701,162
FOLEY CATHETER ASSEMBLY

Philip Rosenberg, Gurnee, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Sep. 24, 1985, Ser. No. 779,751
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—103 10 Claims



1. A catheter assembly comprising a shaft having a drainage lumen and an inflation lumen mateable with a connector with a generally axially disposed bore therethrough and an inflation side arm, said connector comprising:

an inflation means which provides fluid communication between said inflation side arm and said inflation lumen in said shaft, in any rotational orientation of said shaft; and

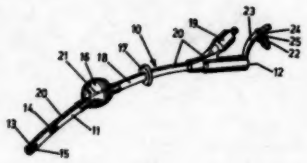
a rotatively enactable sealing means disposed about said bore for securing said shaft in said bore of said connector and for preventing leakage of fluid from said inflation means;

said sealing means comprising at least one annular channel having means for the receipt of adhesive, said channel disposed in said bore radially outwardly of said shaft.

4,701,163
GASTROSTOMY FEEDING DEVICE

Stephen K. Parks, Sunnyvale, Calif., assignor to Medical Innovations Corporation, Milpitas, Calif.

Filed Nov. 5, 1984, Ser. No. 670,381
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—178 14 Claims



1. A gastrostomy catheter device for feeding into a patient's stomach, comprising:

a. an elongate feeding tube having a feeding inlet end and a perforated outlet end for discharging food, the feeding tube extending outwardly from the patient's stomach to support external components of the device;

b. an inflatable balloon structure mounted around the tube and positioned near the outlet end of the tube;

c. an inflation valve mounted near the inlet end of the tube;

d. a valve line connected to the valve and providing an outlet port within the balloon structure, the valve line being positioned adjacent the feeding tube;

e. a closure plug for the feeding inlet and secured to the feeding tube by an integral band and to prevent stomach drainage;

f. a perforated, adjustable ring slidably mounted along the feeding tube, and medially thereof, and sized to frictionally engage the tube; whereby

i. when the balloon is deflated, the feeding tube may be inserted through a stomach and into the patient's stomach;

ii. when the balloon is inflated through the valve and valve line, it is adapted to form a seal within the patient's stomach and adjacent the stoma;

iii. securement of the ring to the tube being provided solely by frictional engagement therebetween, the ring and tube both being made of silicone material, or the like, to secure the device within the patient's body and to prevent undesirable movement of the ring along the tube, whether in the dry state or when lubricated by body fluids, the locking ring being manually adjustable along the tube to accommodate to the size of the patient, and the balloon and ring both functioning to maintain the device in place in the patient;

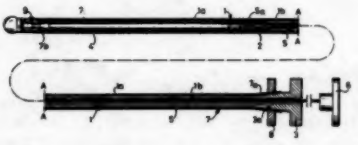
iv. retraction of the ring along the feeding tube away from the patient's body being entirely against frictional engagement forces between the ring and tube to enable the stoma and adjacent areas to be cleaned; and,

v. when the balloon is deflated, retraction of the ring along the feeding tube enables the device to be removed from the patient.

4,701,164
GYNECOLOGICAL INSTRUMENTS, ESPECIALLY FOR TRANSFERRING EMBRYOS

Robert Cassou; Maurice Cassou, both of Rue Clémenceau, and Bertrand Cassou, Saint Symphorien des Bruyeres, all of 61300 L'Aigle, France

Continuation of Ser. No. 681,551, Dec. 14, 1984. This application Jul. 3, 1986, Ser. No. 881,914
Claims priority, application France, Dec. 16, 1983, 83 20172
Int. Cl.[4] A61M 1/00
U.S. Cl. 604—218 11 Claims



1. A gynecological instrument comprising:

a hollow, rigid cyindrical body having a central bore of a first diameter with a distal end and a proximal end;

a housing carried by said distal end having a diameter larger than said first diameter;

a reservoir tube in said housing for reproductive components having an end part projecting beyond the distal end of the cylindrical body;

a rigid, axial piston rod mounted so as to slide in the cylindrical body and projecting beyond the proximal end thereof for sliding into the reservoir tube when said reservoir tube is accommodated in the cylindrical body;

an external protective sheath having a distal end, said sheath closely enveloping in a sliding fashion the cylindrical body and further enveloping the projecting end of the reservoir tube;

a terminal tip provided on said sheath at the sheath distal end wherein the projecting end of the reservoir tube bears on the inside of the terminal tip, the said terminal tip having an exteriorly rounded, solid head and behind said head two portions having different diameters separated by a shoulder, with a first portion of larger diameter than the second portion located at the back of said rounded head and having a cylindrical external surface wherein said shoulder has a height corresponding approximately to the thickness of the protective sheath, with said second portion comprising a cylindrical part of smaller diameter than the first portion located at the back of said first portion behind said shoulder, wherein the external protective sheath fits on said second portion as far as the shoulder, and wherein said rounded head of the terminal tip has the shape of a portion of a sphere with the diameter of the cylindrical external surface of said first portion being smaller than the largest diameter of the portion of a sphere;

an axial passage provided on the inside of said terminal tip, wherein the axial passage is blind at one of its ends and open towards the cylindrical body; and

a lateral transfer orifice of said terminal tip behind said rounded head providing communication for said terminal tip with the outside towards its blind end.

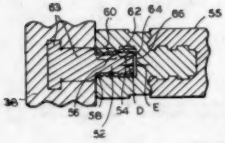
4,701,165
REUSABLE SYRINGES

Lon DeHaitre, Arlington Heights, Ill., assignor to Abbott Interfast Corp., Wheeling, Ill.

Filed Mar. 26, 1986, Ser. No. 844,141
Int. Cl.[4] A61M 5/315
U.S. Cl. 604—228 21 Claims

1. A push rod for a syringe, said push rod having a hole in its end, a first section of the hole being threaded near the entrance

of the hole, a second section of the hole which is remote from the entrance having an internal diameter which is larger than the diameter of the first threaded section in order to form a clearance room at the inner end of said hole, a plunger having a stud with an interrupted thread, the outer end of said stud



having a thread which meshes and mates with the thread in said first section and the inner end of said stud having a smooth perimeter with a diameter which is less than the diameter of said first section of said hole, whereby said smooth inner end of said stud moves freely within the threaded section near the entrance of said hole.

4,701,166

VALVED TWO-WAY CATHETER

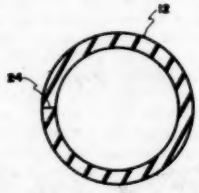
LeRoy E. Groshong, and Ronald J. Brawn, both of Portland, Oreg., assignors to Catheter Technology Corp., Salt Lake City, Utah

Continuation of Ser. No. 791,392, Oct. 25, 1985, Pat. No. 4,671,796, which is a continuation of Ser. No. 491,258, May 3, 1983, Pat. No. 4,549,879. This application Oct. 2, 1986, Ser. No. 914,693

The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—247 **7 Claims**



1. A method of creating a reliable slit valve in a catheter tube comprising the steps of:

providing a catheter tube of synthetic inert material having at least one hollow lumen therein surrounded by wall means;

cutting a slit of desired length in the wall means at a predetermined location so that the slit comprises opposed abutting edges which span from the exterior surface of the wall means to the hollow interior lumen;

weakening the wall means in a vicinity immediately adjacent at least one of said abutting edges of the slit to create a fulcrum site so that positive and negative indewelling pressures beyond predetermined amounts will cause the immediately adjacent wall means to hingedly open outwardly and inwardly respectively to accommodate indwelling effluent and influent liquid flow form and into the lumen.

4,701,167

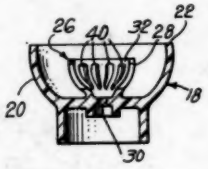
MULTI-DIMENSIONAL APPLICATOR

William J. Chekan, Beverly, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Sep. 16, 1985, Ser. No. 776,310

Int. Cl.[4] A61M *35/00*

U.S. Cl. 604—310 **8 Claims**



1. An applicator for facilitating discharge of disinfectant from an aerosol can, which applicator provides containment and delivery means for disinfectant against a finger of a patient or a larger area of a patient, comprising:

an outer confinement means; and

an inner confinement means disposed within said outer confinement means with an arrangement of orificii through the sides thereof for fluid communication therebetween, said inner confinement means having a distal peripheral surface which defines a plane disposed away from a plane defined by the outer confinement means.

4,701,168

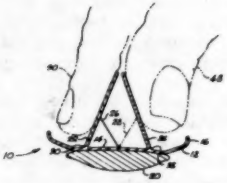
APPLICATOR WITH FULCRUM FOR BENDING

Clifford E. Gammons, Morgantown, N.C., assignor to Span America Medical Systems, Inc., Greenville, S.C.

Filed Apr. 25, 1986, Ser. No. 856,357

Int. Cl.[4] A61M *35/00*

U.S. Cl. 604—310 **19 Claims**



1. A medicant applicator, comprising:

a frangible housing, including

a flexible base supporting member having upper and lower surfaces; and

a removable sealing layer carried on said lower surface of said supporting member;

absorbent means, supported on said supporting member and between said sealing layer and said supporting member, for carrying fluid matter;

fluid matter carried in said absorbent means; and

paired curved actuation means, forming a fulcrum at said upper surface of said housing, and relatively rigidly secured to and extending vertically erect from said upper surface of said housing, for handling of said housing and for being selectively laterally compressed so as to project said absorbent means away from said housing by flexing said base outward thereof, thereby facilitating application of said fluid matter onto a target surface subsequent to rupture of said housing.

4,701,169
OSTOMY APPLIANCE WITH IMPROVED ATTACHMENT MEANS

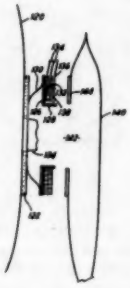
Peter L. Steer, Surrey, England, assignor to Craig Medical Products, Surrey, England

Continuation of Ser. No. 681,176, Dec. 13, 1984, abandoned. This application Aug. 27, 1986, Ser. No. 902,093

Claims priority, application United Kingdom, Dec. 19, 1983, 8333711; Mar. 1, 1984, 8405415; Apr. 12, 1984, 8409483; Apr. 19, 1984, 8410231; May 10, 1984, 8411906; Jun. 19, 1984, 8415610

Int. Cl.[4] A61F *5/44*

U.S. Cl. 604—344 12 Claims



1. An ostomy appliance comprising a bag for receiving discharged wastes, a stomal orifice in one wall of the bag to receive a stoma of a patient, a flange having a flat surface, intended to face towards the body of the wearer when the appliance is worn, surrounding the orifice, a medical grade adhesive pad, and a stack of double sided adhesive annuli, one on top of the other, for attaching the flange of the bag to the pad, said stack of annuli interleaved with peelable cover annuli, said stack and cover annuli carried by the pad and adapted to encircle the patient's stoma, each of the double sided adhesive annuli having a peripherally projecting portion.

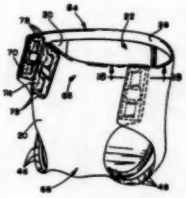
4,701,170
FORM-FITTING SELF-ADJUSTING DISPOSABLE GARMENT WITH FIXED POSITION FASTENERS

John C. Wilson, Neenah; Robert A. Stevens, Appleton; Leona G. Boland; Gregory J. Rajala, both of Neenah, and Stanley R. Kellenberger, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 6, 1985, Ser. No. 773,736

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385 A 29 Claims



1. An anatomically form-fitting, generally selfadjusting disposable absorbent garment comprising:

a breathable elastomeric nonwoven outer cover comprising a nonwoven elastic web joined to one or more gatherable nonwoven webs, including front and back waist sections defining a waist opening, a pair of leg openings, a central crotch section between said leg openings and front and rear panels separated by said crotch section;

an absorbent insert structure substantially superposable on said front and rear panels and said crotch section, including a liquid permeable bodyside liner and a liquid impermeable barrier with an absorbent core disposed therebetween;

attachment means for attaching and integrating said insert to said outer cover while allowing substantially unrestricted functional stretchability thereof; and fixed position fastening means, fastenable only at fixed positions on said outer cover, for providing discrete target locations assuring proper fastening of said garment on a wearer.

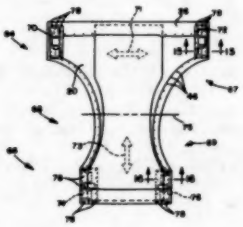
4,701,171
FORM-FITTING SELF-ADJUSTING DISPOSABLE GARMENT WITH A ZONED STRETCHABLE OUTER COVER

Leona G. Boland, Neenah; Georgia L. Zehner, Larsen, and Robert A. Stevens, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 6, 1985, Ser. No. 773,738

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385 A 20 Claims



1. An anatomically form-fitting, generally self-adjusting disposable absorbent garment comprising:

a breathable elastomeric nonwoven outer cover comprising a nonwoven elastic web joined to one or more gatherable nonwoven webs, including a waist opening, a pair of leg openings, a central crotch section between said leg openings and front and rear panels separated by said crotch section, said outer cover having at least two zones wherein stretchability varies between said two zones;

an absorbent insert structure substantially superposable on said front and rear panels and said crotch section, including a liquid permeable bodyside liner and a liquid impermeable barrier with an absorbent core disposed therebetween; and

attachment means for attaching and integrating said insert to said outer cover while allowing substantially unrestricted functional stretchability thereof.

4,701,172
FORM-FITTING SELF-ADJUSTING DISPOSABLE GARMENT WITH FULLY INTEGRATED ABSORBENT STRUCTURE

Robert A. Stevens, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 6, 1985, Ser. No. 773,739

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385 A 33 Claims

1. An anatomically form-fitting, generally self-adjusting disposable absorbent garment comprising:

a breathable elastomeric nonwoven outer cover comprising a nonwoven elastic web joined to one or more gatherable nonwoven webs, including a waist opening, a pair of leg

openings, a central crotch section between said leg openings and front and rear panels separated by said crotch section;

an absorbent insert structure substantially superposable on said front and rear panels and said crotch section, including a liquid permeable bodyside liner and a liquid impermeable barrier with an absorbent core disposed therebetween; and

attachment means for attaching and integrating said insert to said outer cover while allowing substantially unrestricted functional stretchability thereof.

4,701,173

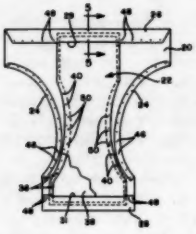
FORM-FITTING SELF-ADJUSTING DISPOSABLE GARMENT WITH ABSORBENT RETAINING FLAPS

Georgia L. Zehner, Larsen; Leona G. Boland, Neenah, and Robert A. Stevens, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 6, 1985, Ser. No. 773,741

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385 A **29 Claims**



1. An anatomically form-fitting, generally self-adjusting disposable absorbent garment comprising:

a breathable elastomeric nonwoven outer cover comprising a nonwoven elastic web joined to one or more gatherable nonwoven webs, including front and rear waist sections defining a waist opening and pocket-forming means at each of said waist sections defining a receiving pocket therein, a pair of leg openings, a central crotch section between said leg openings and front and rear panels separated by said crotch section;

an absorbent insert structure having opposed longitudinal ends respectively received within said pocket-forming means, said insert being substantially superposable on said front and rear panels and said crotch section, including a liquid permeable bodyside liner and a liquid impermeable barrier with an absorbent core disposed therebetween; and

attachment means for attaching and integrating said insert to said outer cover while allowing substantially unrestricted functional stretchability thereof.

4,701,174

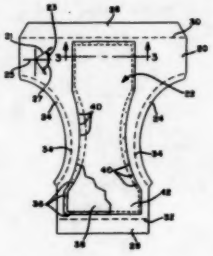
FORM-FITTING SELF-ADJUSTING DISPOSABLE GARMENT WITH ANGLED DIRECTION STRETCHABLE OUTER COVER

Lynn A. Johnson, DePere, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 6, 1985, Ser. No. 773,745

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385 A **17 Claims**



1. An anatomically form-fitting, generally self-adjusting disposable absorbent garment comprising:

a breathable elastomeric nonwoven outer cover resiliently stretchable in at least one direction wherein said at least one direction is at a selected angle measured from a cross-body direction, said cover comprising a nonwoven elastic web joined to one or more gatherable nonwoven webs, including a waist opening, a pair of leg openings, a central crotch section between said leg openings and front and rear panels separated by said crotch section;

an absorbent insert structure substantially superposable on said front and rear panels and said crotch section, including a liquid permeable bodyside liner and a liquid impermeable barrier with an absorbent core disposed therebetween; and

attachment means for attaching and integrating said insert to said outer cover while allowing substantially unrestricted functional stretchability thereof.

4,701,175

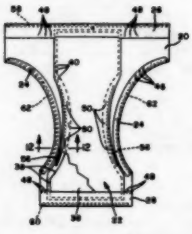
FORM-FITTING SELF-ADJUSTING DISPOSABLE GARMENT WITH ELASTIC WAIST AND LEGS

Leona G. Boland, Neenah, and Robert A. Stevens, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 6, 1985, Ser. No. 773,746

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385 A **23 Claims**



1. An anatomically form-fitting, generally self-adjusting disposable absorbent garment comprising:

a breathable elastomeric nonwoven outer cover comprising

a nonwoven elastic web joined to one or more gatherable nonwoven webs, including a waist opening, a pair of leg openings, a central crotch section between said leg openings and front and rear panels separated by said crotch section;

an absorbent insert structure substantially superposable on said front and rear panels and said crotch section, including a liquid permeable bodyside liner and a liquid impermeable barrier with an absorbent core disposed therebetween; and

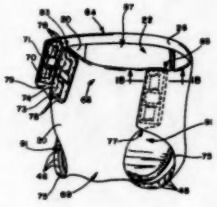
attachment means for attaching and integrating said insert to said outer cover while allowing substantially unrestricted functional stretchability thereof; and front and rear waist sections defining said waist opening wherein a supplemental elastic member is disposed along a portion of either of said front and rear waist sections to further gather said garment about a wearer.

4,701,176

FORM-FITTING SELF-ADJUSTING DISPOSABLE GARMENT WITH FIXED FULL-LENGTH FASTENERS

John C. Wilson, Neenah; Robert A. Stevens, and Stanley R. Kellenberger, both of Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 6, 1985, Ser. No. 773,747
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 A **29 Claims**



1. An anatomically form-fitting, generally self-adjusting disposable absorbent garment comprising:

a breathable elastomeric nonwoven outer cover comprising a nonwoven elastic web joined to one or more gatherable nonwoven webs, including front and back waist sections defining a waist opening, a pair of leg openings, a central crotch section between said leg openings and front and rear panels separated by said crotch section;

an absorbent insert structure substantially superposable on said front and rear panels and said crotch section, including a liquid permeable bodyside liner and a liquid impermeable barrier with an absorbent core disposed therebetween; and

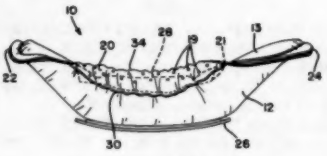
attachment means for attaching and integrating said insert to said outer cover while allowing substantially unrestricted functional stretchability thereof; and full-length releasably engageable fastening means for effecting a substantially full-length, continuous and noncollapsible closure from said waist opening to each of said leg openings thereby maintaining the dimensional integrity of said garment.

4,701,177

THREE-DIMENSIONAL SHAPED FEMININE PAD WITH NARROW, ABSORBENT CENTER AND WINGED EDGES

Louise C. Ellis; Anne M. Fahrenkrug, both of Appleton; Julie T. Basten, Green Bay, and James D. Milner, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 13, 1986, Ser. No. 818,438
Int. Cl.[4] A61F *13/18*
U.S. Cl. 604—385 A **17 Claims**



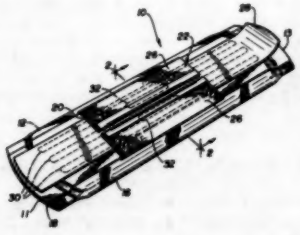
1. An elongated catamenial or mold incontinence pad curved to the body shape having relatively long sides and narrowed ends for absorption of bodily excretions comprising a liquid-impermeable backing member having generally parallel longitudinal sides, an hour glass shape absorbent inner member and a liquid-permeable body-side member, wherein said absorbent generally has a narrow center portion shape, said backing member extends beyond said absorbent and has side edges forming flaps in the areas where the narrower portion of the absorbent does not overlay said backing, said flaps being gathered thereby raising said flap to form a wall on each side of the narrower portion of said absorbent wherein the distance between said walls is about the width of the widest part of said absorbent, wherein said absorbent is 1.75–3 times thicker in the middle of said pad than at the ends, wherein elastic is coextensive with the flap and wherein said flaps extend upward from about the middle of the vertical height of the thickest portion of said absorbent.

4,701,178

SANITARY NAPKINS WITH FLAPS

Frank S. Glaug, Spotswood; Thomas J. Luceri, Bridgewater, and Deborah J. Parr, Plainsboro, all of N.J., assignors to Personal Products, Inc., Milltown, N.J.

Filed Dec. 1, 1986, Ser. No. 936,683
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—387 **18 Claims**



1. An absorbent product having oppositely disposed ends and longitudinal edges, comprising:

a central absorbent element having a body facing side and a garment facing side;

a sheet of fluid impervious barrier material disposed on the garment facing side of said absorbent element and having an element facing side opposing said absorbent element and a garment facing side;

a pair of flaps extending respectively from the longitudinal edges of said product and having body facing sides and garment facing sides;

adhesive means located on the garment facing side of said barrier material and on the garment facing side of at least one of said flaps: and

a release strip having a first side overlying said barrier material adhesive means and a second side, wherein those of said flaps having adhesive means located thereon are folded over said strip with said flap adhesive means contacting the second side of said release strip.

4,701,179

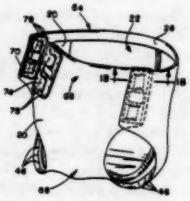
FIXED POSITION FASTENERS FOR DISPOSABLE ABSORBENT GARMENTS

Stanley R. Kellenberger, Appleton; Gregory J. Rajala, Neenah, and Robert A. Stevens, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 773,742, Sep. 6, 1985, abandoned. This application Nov. 10, 1986, Ser. No. 928,738

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—394 **16 Claims**



1. A fixed point fastener system for a disposable absorbent garment of the type having leg and waist portions, said fastener system comprising:

an outer cover;

an absorbent structure including a liquid impervious barrier means, a liquid pervious body side linear means and an absorbent component therebetween;

said fixed point fastener system including first and second pairs of like fastener members respectively attached to fixed fastening locations on said outer cover and having complementary cross sections for maintaining releasably interlocking mating engagement of each of said first pair of fastener members with each of said second pair of fastener members without penetration thereof into said outer cover, each of said fastener members having an essentially flat flexible base extending between the waist and leg portions with a pair of clasps disposed thereon, said pair of clasps being separated by an apertured first portion of said base, for allowing flexion of said base thereat, said fastener members being sufficiently flexible to prevent skin irritation of the wearer and sufficiently inflexible to prevent unwanted unfastening thereof.

4,701,180

IMPLANTED ANCHOR AND INSERT WITH ANALOG DISPLAY

L. Thomas Kelly; Esther V. M. Hamel, both of Rte. 1, Box 68, St. Ignatius, Mont. 59865, and Robert P. Bielka, 2211 N. 59th St., Seattle, Wash. 98103

Filed Feb. 19, 1986, Ser. No. 830,999

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—891 **34 Claims**

1. A diagnostic or medicant dispensing assembly for animals, comprising:

(a) an anchor having

(i) a flat annular anchor flange positionable adjacent the surface of the animal's skin,

(ii) a sleeve fixedly attached around an opening of the anchor flange, and extending therefrom into the animal, and

(iii) retention means for retaining the anchor in the animal; and

(b) an insert having

(i) a substantially flat insert flange,

(ii) a tube fixedly attached around an opening of the insert flange, and extending therefrom through the sleeve of the anchor into the animal,

(iii) a substantially solid material disposed with the tube, said material progressively dissolving to administer a medicant contained therein to the animal, or progressively liquefying in response to a diagnostic or any other condition or interest in the animal, and

(iv) analog indicator means for producing a proportionate visual analog display of the extent of dissolution or liquefaction of the material within the tube.

4,701,181

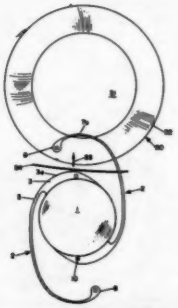
POSTERIOR CHAMBER LENS IMPLANT

Eric J. Arnott, 75 Abbotsbury Road, London W14, England

Filed Jul. 2, 1986, Ser. No. 881,084

Int. Cl.[4] A61F *2/16*

U.S. Cl. 623—6 **4 Claims**



1. A posterior chamber lens implant comprising a lens having a periphery and a pair of similar holding loops formed integrally therewith, wherein each loop comprises a first flange portion projecting radially outwardly from said periphery and elongated circumferentially along said periphery, said flange portion having an outer edge subtending an arc spaced radially outwards from said periphery, and each loop further comprises a free, relatively thin loop portion projecting from said flange portion; wherein the flange portions of the holding loops are substantially diametrically opposite each other around the periphery of the lens; wherein the free loop portion of each loop is curved so as to overlap the flange portion of the other loop such that the loops encircle the lens; wherein the free loop portion, when compressed, contacts the flange portion, rather than the free loop portion, of the other loop; wherein the loops include a leading edge for insertion axially through an incision in the eye and the opposed flange portions are substantially axially oriented during such insertion such that one of the flange portions acts as a guide for the lens; and wherein the encircling loops, when implanted in the eye, act to center the lens and protect the lens against secondary fiber growth.

4,701,182

PAD COLD-DWELL PROCESS FOR DYEING WOOL PIECE GOODS WITH REACTIVE DYES UNDER ACID PH

Hans-Ulrich von der Eltz; Hans-Peter Maier, and Karl-Heinz Röstermundt, all of P.O. Box 80 03 20, D-6230 Frankfurt am Main 80, Fed. Rep. of Germany

Filed Nov. 5, 1986, Ser. No. 927,801

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539475

Int. Cl.[4] D06P *3/82;* C09B *62/00;* D06B *19/00*

U.S. Cl. 8—533 13 Claims

1. A pad cold-dwell process for dyeing piece goods made of wool or wool-containing fiber mixtures in an acid medium using reactive dyes, which comprises padding the weblike textile material at a pH value between 1.5 and 4 and at temperatures within the range of from about 20° to 25° C. with an aqueous liquor containing the dissolved reactive dyes but no urea and then, to fix the dyes, allowing this padded material to dwell for 18 to 36 hours in the moist state while maintaining the adjusted acid conditions and without further heat supply.

4,701,183

PROCESS FOR REMOVING SULFUR FROM COAL

John T. Riley, 1511 Woodhurst Dr., Bowling Green, Ky. 42101, and Dwight D. Watson, 5408 Apple La., West Deptford, N.J. 08066

Filed Sep. 16, 1985, Ser. No. 776,467

Int. Cl.[4] C10L *9/06*

U.S. Cl. 44—1 SR 8 Claims

1. A process for removing sulfur from coal comprising the steps of:

forming a slurry of sulfur containing coal; carrier liquid and a compound selected from the group consisting of carboxylic acids, percarboxylic acids, salts of carboxylic acids, salts of percarboxylic acids, and any combination;

heating the slurry in an atmosphere containing oxygen gas; and,

separating the coal from the other slurry components after heating.

5. The process of claim 1 wherein the carrier liquid is water.

6. The process of claim 1 wherein the compound group consists of formic acid, salts of formic acid, performic acid, salts of performic acid, and any combination thereof.

4,701,184

UPGRADING SOLID FUELS

Kaye F. Harvey, North Carlton; Reginald B. Johns, North Balwyn; Alan S. Buchanan, Kallista, and David A. Cain, Heidelberg, all of Australia, assignors to The University of Melbourne and CRA Services Limited, both of, Australia

Filed Feb. 7, 1986, Ser. No. 827,319

Claims priority, application Australia, Feb. 14, 1985, PG9283

Int. Cl.[4] C10L *5/06;* B02C *23/18*

U.S. Cl. 44—10 D 16 Claims

1. Process for treatment of brown coal which comprises subjecting the said coal to shearing forces to produce a plastic mass which is capable of conversion by subsequent compaction and drying into a fuel of increase density and enhanced calorific value, characterised in that the water content of the coal is more than 54% and the shearing forces are applied for less than one hour.

4. Process for treatment of a quantity of brown coal to produce a plastic mass which is capable of conversion by subsequent compaction and drying into a fuel of increased density and enhanced calorific value, which comprises subjecting a portion of the said quantity to shearing forces for a period of less than one hour and blending the so-treated portion with the remainder of the said quantity to produce the said plastic mass.

14. The product of a process according to claim 1 .

4,701,185

PROCESS FOR SEPARATING FLY-ASH

Günter K. Eckstein, Hamburg, Fed. Rep. of Germany, assignor to Shell Oil Company, Houston, Tex.

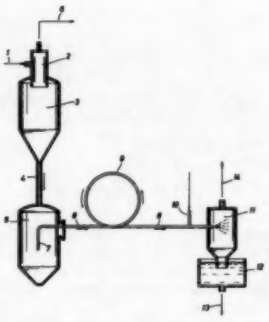
Continuation of Ser. No. 493,185, May 10, 1983, abandoned.

This application Apr. 26, 1985, Ser. No. 726,950

Claims priority, application Fed. Rep. of Germany, May 10, 1982, 3217483

Int. Cl.[4] C10K *1/02;* B01D *45/16;* B65G *53/14*

U.S. Cl. 48—197 R 8 Claims



1. A process comprising separating fly-ash and a minor portion of synthesis gas from a fly-ash-containing stream of synthesis gas at relatively high pressure, collecting said fly-ash and recovering said minor portion of synthesis gas in a first vessel at relatively high pressure, expanding recovered pressurized synthesis gas in said first vessel through at least one long and narrow pipe, the inlet of which dips under the upper level of the fly-ash collected in the first vessel and the outlet of which is situated in a second vessel at a relatively low pressure, the gas flow through the pipe or pipes entraining the fly-ash.

4,701,186

POLYMERIC MEMBRANES WITH AMMONIUM SALTS

Anthony Zampini, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 30, 1983, Ser. No. 509,637

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—158 6 Claims

1. An asymetric polymeric gas separation membrane membrane in a hollow fiber form having a porous support and a thin dense layer, said membrane having ammonium salts bonded to phenylene oxide polymers of the porous support essentially at the layer of said membrane, wherein the ammonium salts enhance the separation factor of said membrane.

6. An asymetric phenylene oxide polymeric gas separation membrane having a porous support and a thin dense layer, said membrane having ammonium salts bonded to the polymer essentially at the layer of said membranes; the ammonium salts having the structural formula:

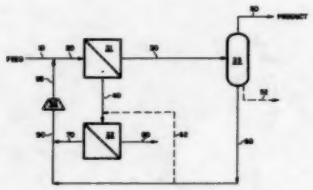
$$N-HR_1,R_2Y,$$

wherein R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, lower alkyl groups or lower acyl groups having one (1) to four (4) carbons, wherein said groups are bonded to phenyl rings within said polymer and provide cross-linkage between polymer chains; and Y is an anion radical selected from the group consisting of fluoro, chloro, bromo, iodo, acyl, cyano, perchloro, bicarbonate, nitro and sulfono.

4,701,187
PROCESS FOR SEPARATING COMPONENTS OF A GAS STREAM

Jung S. Choe, Allentown; Steven R. Auvil, Macungie, and Rakesh Agrawal, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 3, 1986, Ser. No. 926,695
Int. Cl.[4] B01D *53/22, 53/04*
U.S. Cl. 55—16 **32 Claims**



1. A process for recovering a desire component from a multi-component feed gas stream, said process comprising:

(a) passing said feed gas stream to a plurality of membrane separation units to produce a stream concentrated in the desired component;

(b) passing said concentrated stream to an adsorption unit containing an adsorbent that selectively adsorbs non-desired gaseous components present in said stream to produce a product stream further concentrated in the desired component;

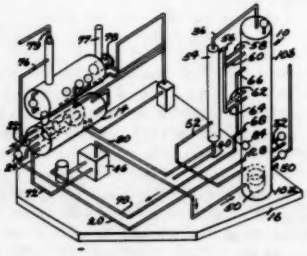
(c) desorbing the gaseous components from said adsorbent; and

(d) recycling said desorbed gaseous components to the feed gas stream entering the membrane separation units.

4,701,188
NATURAL GAS CONDITIONING SYSTEM AND METHOD

Charles R. Mims, Sumrall, Miss., assignor to Mark Industries, Inc., Palo Alto, Calif.

Filed Aug. 7, 1984, Ser. No. 638,554
Int. Cl.[4] B01D *47/10*
U.S. Cl. 55—20 **11 Claims**



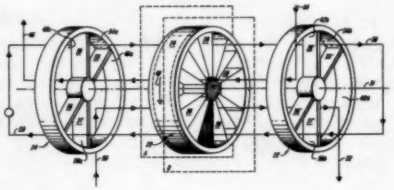
1. In a method for conditioning natural gas from a gas well, said method including expanding the gas to separate liquid water and condensible hydrocarbons therefrom, contacting the resulting wet gas with a liquid dessicant which absorbs water vapor from the wet gas and heating the liquid dessicant to drive off water therefrom, the improvement comprising maintaining the temperature of the expanding gas within a preselected range by controllably heating the gas prior to expansion by heat exchange with heated dessicant from the dessicant-heating step in response to the temperature of the expanding gas.

4. In apparatus for conditioning natural gas from a gas well including a separator in which the gas is expanded through a choke into a separator space and from which liquid water and condensed liquid hydrocarbons are removed, a dehydrator in which wet gas from the separator is contacted with a liquid dessicant which absorbs water vapor from the wet gas, and a reboiler for heating the liquid dessicant from the dehydrator to drive off water from the dessicant: heat exchange means for heating well gas before the gas passes through said choke o said separator space; and control means responsive to the temperature in said separator space for controlling the flow of gas through said heat exchange means to thereby control the temperature in said separator space.

4,701,189
ROTARY SORPTION BED SYSTEM AND METHOD OF USE

Michael D. Oliker, Amesbury, Mass., assignor to Near Equilibrium Research Associates, Amesbury, Mass.

Continuation of Ser. No. 675,459, Nov. 28, 1984, abandoned, which is a continuation of Ser. No. 484,186, Apr. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 361,134, Mar. 24, 1982, abandoned, which is a division of Ser. No. 166,054, Jul. 7, 1980, Pat. No. 4,324,564. This application Oct. 22, 1985, Ser. No. 790,055
Int. Cl.[4] B01D *53/06, 53/26*
U.S. Cl. 55—34 **39 Claims**



1. A method of operating a sorption bed system comprising a mass of thermally regenerable sorbent material, said method comprising the steps of:

A. providing a course comprising a series of means for circulating fluid streams sequentially through a given volume of said mass;

B. moving either said mass or said course whereby said given volume sequentially passes, during a cycle, through first, second, third, and fourth regions;

C. passing a fluid feed containing sorbate through sorbent material in said first region in a first direction to produce a fluid product of reduced sorbate concentration and to load sorbate onto sorbent material in said first region;

D. passing a hot regenerant fluid through sorbent material in said third region countercurrent to said first direction to produce a fluid effluent comprising a sorbate-rich waste and to heat sorbent material in said third region; and

E. recirculating fluid between sorbent material in said second region, cocurrent to said first direction, and sorbent material in said fourth region countercurrent to said first direction.

14. A sorption bed system of improved efficiency comprising a mass of thermally regenerable sorbent material and a course comprising a series of means for directing fluid streams sequentially through a given volume of said mass of sorbent, said system comprising:

first means for passing a fluid feed containing sorbate through a first region containing sorbent material to produce a fluid product of reduced sorbate concentration and to load sorbate onto the sorbent material in said first region;

third means for passing, countercurrent to the direction of flow in said first means for passing, a hot regenerant fluid through a third region containing sorbent material to

produce a fluid effluent comprising a sorbate-rich waste and to heat sorbent material in said third region;

means for recirculating fluid between a second region containing sorbent material, said second region being disposed between said first and third regions, and a fourth region containing sorbent material, said fourth region being disposed between said third and first regions, the direction of recirculating in said second region being cocurrent to fluid passing through said first means for passing, and the direction of recirculating in said fourth region being cocurrent to fluid passing through said third means for passing; and

means for moving one of said mass and said course whereby said given volume sequentially passes through said first, second, third, and fourth regions, and back to said first region.

4,701,190

PROCESS FOR RECOVERING METHYLACETYLENE AND/OR PROPADIENE

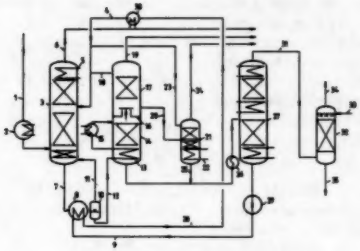
Peter C. Haehn, Geretsried, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 7, 1986, Ser. No. 927,978

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539553

Int. Cl.[4] B01D *53/14*

U.S. Cl. 55—49 **16 Claims**



1. A gas absorption process for the recovery of methylacetylene and/or propadiene from a C_3-containing feed stream comprising scrubbing the feed stream in an absorber column with a first stream of solvent under an elevated pressure to absorb methylacetylene and propadiene; selectively stripping propadiene from resultant loaded first stream solvent to provide a gaseous phase containing mostly propadiene and a minor amount of residual gas fraction; rescrubbing stripped propadiene with a second solvent under a lower pressure to absorb propadiene selectively from the residual gas fraction; and separating propadiene from resultant second solvent loaded selectively with propadiene, and separating methylacetylene from resultant first stream of solvent loaded selectively with methylacetylene.

4,701,191

SPRAY UNIT AND DEGASSING INSTALLATION

Johannes G. Kreuwel, Delden, and Lambert A. Schipper, Hengelo, both of Netherlands, assignors to Stork Ketels B.V., Netherlands

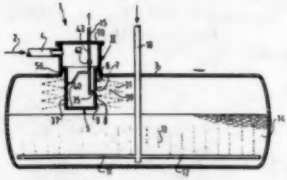
Filed Sep. 15, 1986, Ser. No. 907,393

Claims priority, application Netherlands, Sep. 20, 1985, 8502592

Int. Cl.[4] B01D *47/02*

U.S. Cl. 55—198 **8 Claims**

1. A degassing spray unit comprising the combination of a stack of separate rings and a bottom plate closing off the bottom of the stack of rings, means for holding the stack of rings and the bottom plate together to form a unit having a generally cylindrical wall, there beings pairs of adjacent rings presenting outwardly projecting plates having mutually bent outer peripheries defining slit-like spray apertures, and degassing conduit means within said stack for directing gas inwardly



through the wall adjacent to some of said pairs of adjacent rings to a point of discharge, said degassing conduit means having a coupling member at said point of discharge to permit the unit to be removed and replaced in a degassing assembly.

4,701,192

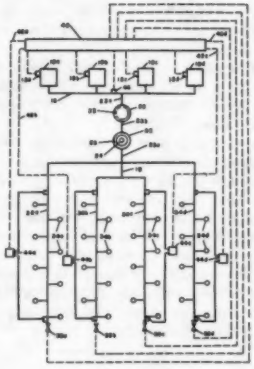
VACUUM SYSTEM

David D. Burke, Midlothian, Va., assignor to Tidewater Industrial Components, Inc., Richmond, Va.

Continuation of Ser. No. 740,254, May 31, 1985, abandoned. This application Aug. 28, 1986, Ser. No. 902,080

Int. Cl.[4] B01D *45/12*

U.S. Cl. 55—213 **11 Claims**

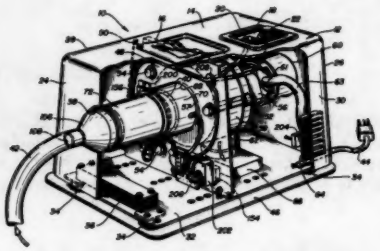


1. A multiple inlet vacuum cleaning system, comprising a group of independently openable and closeable collection inlets for sucking in air and trash carried in by the air, means to remove trash from said air, a common conduit connected to said collection inlets, vacuum generating means connected to draw air from the common conduit at a position along the common conduit downstream of said collection inlets, air inlet means openable to admit enough air to the common conduit to blow out residual trash therein, means to sense conditions indicating low flow of air through the common conduit likely to leave residual trash therein, such as when few collection inlets are open, and means responsive to the sensing means for opening said air inlet means when such low flow air is sensed.

4,701,193
SMOKE EVACUATOR SYSTEM FOR USE IN LASER SURGERY

Philip D. Robertson, and Armando N. Solorzano, both of Colorado Springs, Colo., assignors to Xanar, Inc., Colorado Springs, Colo.

Filed Sep. 11, 1985, Ser. No. 774,692
Int. Cl.[4] B01D *46/42*
U.S. Cl. 55—217 **15 Claims**



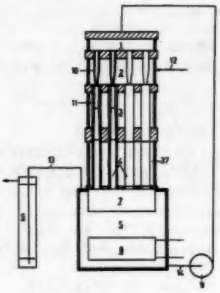
1. An apparatus for removing by-products of laser surgery from the surgical site comprising:
- a housing defining a first chamber having an inlet and an outlet;
- a fitting attached to and provising fluid communication into said first chamber, said fitting having an inlet and an outlet and defining a second chamber between said inlet and said outlet;
- a filter removably disposed at said fitting inlet and having and inlet and an outlet;
- means for maintaining a negative pressure within said first chamber and thus establishing a flow of air through said filter, said fitting and said first chamber to deliver laser surgery by-products to said filter with the flow of air so that said filter may trap and remove laser surgery by-products from the flow;
- temperature sensing means disposed in said second chamber for measuring the temperature of air in said second chamber and for generating a signal indicative of a clogged condition of said filter; and
- a common mounting plate for said fitting and said housing said common mounting plate having a first and second opposed sides said fitting extending from said first side of said mounting plate and said housing extending from said second side of said mounting plate; and
- said second chamber defined by said fitting including a generally cylindrical cross section, said cross section converging from said fitting inlet to the vicinity of said temperature sensing mens and then remaining at a constant diameter from the vicinity of said temperature sensing means to said fitting outlet.

4,701,194
GAS-TREATING DEVICE

Charles Weyers, Oud-Turnhout; Michel Klein, and Walter Goossens, both of Mol, all of Belgium, assignors to Studiecentrum voor Kernenergie, "S.C.K.", Brussels, Belgium

Filed Feb. 13, 1986, Ser. No. 828,894
Claims priority, application Belgium, Feb. 20, 1985, 2/60621
Int. Cl.[4] B01D *47/10*
U.S. Cl. 55—228 **2 Claims**

1. A gas treating device comprising:
- a liquid chamber,
- several nozzles connected to said liquid chamber for receiving liquid from said liquid chamber,
- several venturi fittings, one venturi fitting for each nozzle, each nozzle having an outlet at a distance in the range from 5 to 100 mm from a smallest cross-section of the venturi fitting into which it opens, said nozzles thus forming with said venturi fittings ejector venturi fittings,
- a gas chamber surrounding the nozzles,
- an inlet to said gas chamber for bringing gas into said gas chamber,
- a tank into which said venturi fittings open,
- a separator of gas and liquid at the entry of said tank,
- a first outlet at the top of this tank for evacuating gas from this tank,

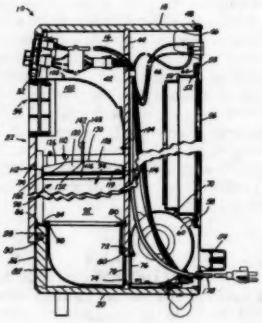


- a de-mister to which said first outlet is connected,
- a second outlet at the bottom of this tank for evacuating liquid from this tank,
- a line connecting the second outlet of this tank to an entry of said liquid chamber,
- a heat exchanger in said tank and connected to a space outside this tank, and
- a pump in said line.

4,701,195
ROOM AIR TREATMENT SYSTEM

Henry J. Rosendall, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.

Filed Jul. 3, 1986, Ser. No. 881,940
Int. Cl.[4] B01D *46/10*
U.S. Cl. 55—473 **20 Claims**



1. An air filtration device, comprising:
- a filter housing including a front panel, a rear panel, side panels and top and bottom panels, said housing defining an air inlet aperture in said rear panel and an air outlet aperture in said front panel;
- a filter disposed within said filter housing, said housing including support means defining a flange for supporting said filter downstream of said air inlet aperture; and

filter retaining means within said housing for retaining said filter in an operative position, said retaining means comprising:

a frame engaging said filter at an end opposite said air inlet; and

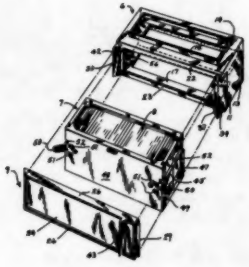
a resilient means mounted within said housing for movement between an operative position engaging said frame and resiliently biasing said frame to sealingly clamp said filter between said frame and said flange and a release position releasing said frame and permitting removal of said filter from said housing.

4,701,196

AIR FILTER ASSEMBLY

John J. Delany, Madison, Wis., assignor to Research Products Corporation, Madison, Wis.

Filed Sep. 15, 1986, Ser. No. 906,928
Int. Cl.[4] B01D *46/52*
U.S. Cl. 55—481 8 Claims



1. An air filter assembly (1) for connection to a duct (2) of an air treating system (3) wherein air flows from upstream to downstream, said assembly comprising, in combination:

(a) a generally rectangular outer casing (6) for mounting to the said duct, said casing being open on its upstream and downstream portions as well as on its front portion,

(b) said casing having end walls (10, 11) joining a rear wall (12), and having a bottom downstream wall (17), said walls being generally planar,

(c) a generally rectangular inner drawer (7) adapted for insertion and removal through said casing's open front portion (19),

(d) said drawer having end walls (44, 45) joining a front wall (48) and a rear wall (46),

(e) a filter (8) disposed in said drawer,

(f) a cover (9) for closing said front casing portion when said drawer is disposed within said casing,

(g) cooperative latch means (29–42) on the ends of said cover (9) and said casing end walls (10, 11) for removably latching said cover to the said casing front portion, said latch means being constructed so that said cover is reversibly attachable to said casing,

(h) grooves (52) disposed in said drawer end walls (44, 45) and extending rearwardly from the front of said drawer,

(i) rails (56) disposed on said casing end walls (10, 11) and extending rearwardly from the front of said casing, said rails being rceivable within said grooves so tha said drawer is slideable along said rails,

(j) said grooves (52) and rails (56) being registerable only when said drawer (7) is in a right-side-up position relative to said casing (6),

(k) and cooperative biasing means (59, 60) on said casing and said drawer to force the front and rear portions of said drawer downstream when said drawer is slid to its rearmost position within said casing, so that the upstream portions (54, 57) of said grooves and rails are sealingly engaged,

(l) said cooperative latch means comprising:

(1) first inclined lip means (29, 30) disposed on said ends of said cover (9),

(2) shoulder means (31, 32) disposed adjacent said cover lip means,

(3) and panel means (34, 39) set back into the plane of said casing end walls (11, 10) and with said panel means extending forwardly of said casing and including second inclined lip means (37, 42) engageable with said shoulder means,

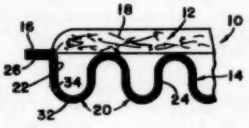
(4) said panel means being springably flexible so that as an end of said cover is pressed rearwardly, a said first lip means (29, 30) rides over said second lip means (37, 42) and snaps into place in engagement with a said shoulder means (31, 32).

4,701,197

MOLDED PANEL FILTER

Donald I. Thornton, Warwick, and Clarke A. Rodman, East Providence, both of R.I., assignors to Allied Corp., Morristown, N.J.

Filed Oct. 7, 1986, Ser. No. 916,270
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—487 10 Claims

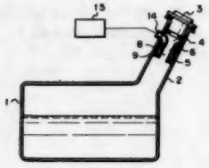


1. Fluid filter element comprising a first filtering medium and a second filtering medium, said first filtering medium comprising a first batt of nonwoven randomly arrayed fibers and containing a thermoplastic material, said first batt defining a main body portion and a substantially flat marginal edge portion circumscribing said main body portion, the thermoplastic material in said marginal edge portion stiffening the fibers in said marginal edge portion to provide a substantially fluid impermeable support and sealiang structure for said first batt, said second filter medium comprising a second batt of nonwoven randomly arrayed fibers and containing a thermoplastic material, said second batt having a main body portion in which the fibers in said main body portion of said second batt are stiffened by said thermoplastic material, said main body portion of said second batt being compressed and molded into a convoluted shape portion, said second filtering medium having a substantially flat circumferential edge portion extending from the main body portion of said second batt and containing fibers stiffened by said thermoplastic material to provide a substantially fluid impermeable support and sealing structure complementary to and registering with said marginal edge portion, said marginal edge portion being sealed to said circumferential edge portion.

4,701,198
FUEL TANK FOR USE IN A MOTOR VEHICLE

Koji Uranishi, Susono; Takaaki Ito, Mishima, and Toshio Tanahashi, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 22, 1985, Ser. No. 715,159
Claims priority, application Japan, Mar. 24, 1984, 59-55236; Mar. 24, 1984, 59-55238; Mar. 24, 1984, 59-55241; Mar. 26, 1984, 59-56154
The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.
Int. Cl.[4] B01D *53/04, 53/14;* B65D *90/28;* F16K *24/04*
U.S. Cl. 55—387 15 Claims

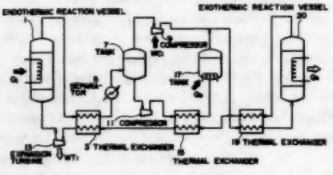


1. A fuel tank for use in a motor vehicle, comprising:
a fuel inlet pipe connected to the fuel tank and having a fuel inlet;
a cap removably engaged within said fuel inlet;
a nozzle guide disposed within said fuel inlet pipe, said nozzle guide including a substantially cylindrical portion spaced from said inlet pipe, said cylindrical portion and said fuel inlet pipe defining a substantially toroidally shaped valve chamber therebetween, said valve chamber including port means for transfering vapor between the fuel tank and said valve chamber;
a cannister having activated carbon therein, said cannister being in vapor communication with said valve chamber; and
valve means arranged in said valve chamber for controlling vapor communication between the fuel tank and said valve chamber, said valve means opening said port means when said cap is disengaged from said fuel inlet.

4,701,199
CHEMICAL HEAT PUMP SYSTEM

Toshiaki Kabe, 3424 Honmachida, Machida-shi, Tokyo-to, and Hideo Kameyama, 5-2-102, Honcho 1-chome, Koganei-shi, Tokyo-to, both of Japan

Filed Apr. 24, 1986, Ser. No. 855,457
Claims priority, application Japan, May 1, 1985, 60-92187
Int. Cl.[4] F25D *5/00*
U.S. Cl. 62—4 8 Claims

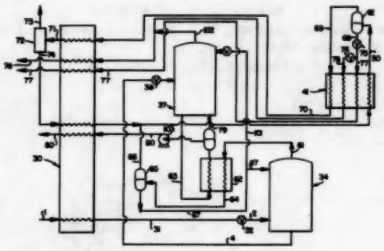


1. In a chemical heat pump system utilizing a reversible decomposition reaction-addition reaction system wherein a gaseous product is generated in said decomposition reaction in a decomposition vessel (1); an improved chemical heat pump system characterized by separating by separator means (5) the mixture of a gaseous phase component and a liquid phase component from said decomposition reaction into a gas phase, and a liquid phase, then after compression feeding said gas phase and liquid phase into an addition-reaction vessel (20) after separatly compressing each of said phases.

4,701,200
PROCESS TO PRODUCE HELIUM GAS

Theodore F. Fisher, Tonawanda; Thomas C. Hanson, Buffalo, and Joseph A. Weber, Cheektowaga, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 24, 1986, Ser. No. 911,220
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—27 12 Claims



1. A process for the production of helium gas comprising:
(A) cooling, expanding and partially liquefying a feed comprising methane, nitrogen and helium;
(B) introducing resulting two-phase feed into a column operating at a pressure within the range of from 250 to 450 psia;
(C) within the column, separating the feed into methane liquid and nitrogen-helium vapor;
(D) withdrawing nitrogen-helium vapor from the column;
(E) partially condensing nitrogen-helium vapor to produce helium-richer vapor and nitrogen-richer liquid;
(F) partially condensing helium-richer vapor to produce crude helium gas and nitrogen-rich liquid;
(G) warming crude helium gas by indirect heat exchange with cooling feed;
(H) purifying crude helium gas to produce product helium gas and helium-containing waste gas; and
(I) passing helium-containing waste gas to helium-richer vapor upstream of step (F).

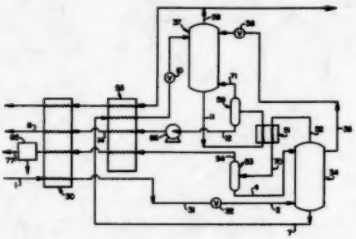
4,701,201
PROCESS TO PRODUCE COLD HELIUM GAS FOR LIQUEFACTION

Thomas C. Hanson, Buffalo; Theodore F. Fisher, Tonawanda; Joseph A. Weber, Cheektowaga, and Ravindra F. Pahade, Getzville, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 24, 1986, Ser. No. 911,226
Int. Cl.[4] F25J *3/02*
U.S. Cl. 62—27 10 Claims

1. A process for the production of cold helium gas comprising
(A) introducing a feed containing methane, nitrogen and helium into a nitrogen rejection unit and separating the feed within the nitrogen rejection unit into helium richer vapor, nitrogen-richer fluid, and methane-richer liquid;
(B) withdrawing nitrogen richer fluid and helium-richer vapor from the nitrogen rejection unit, said withdrawn nitrogen-richer fluid being at a temperature within the range of from 77 to 120 K;
(C) purifying the helium-richer vapor to a purity of at least 99.99 percent helium;
(D) cooling resulting helium vapor by indirect heat ex-

change with warming nitrogen-richer fluid to produce cold helium gas; and



(E) passing cold helium gas to a helium liquifier for liquefaction into liquid helium.

4,701,202

MOULDING APPARATUS FOR GLASSWARE FORMING MACHINE

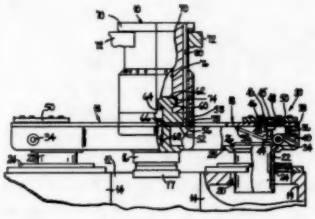
Thomas V. Foster, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 690,440, Jan. 11, 1985, abandoned, which is a continuation of Ser. No. 527,589, Aug. 29, 1983, abandoned. This application Sep. 8, 1986, Ser. No. 906,562

Claims priority, application United Kingdom, Sep. 3, 1982, 8225188

Int. Cl.[4] C03B *9/14, 11/12, 9/38*

U.S. Cl. 65—265 **7 Claims**



1. A moulding apparatus for use in a cyclically operating glassware forming machine, comprising a mould including a bottom plate defining a bottom portion of a cavity of the mould in which molten glass is moulded in the operating of the machine, and two side portions defining side portions of the cavity, each side portion being movable in a cycle of operation of the machine to a first position thereof in which each side portion engages the bottom plate and the other side portion to cooperate in defining the mould cavity so that moulding can take place and to a second position thereof in which the side portions are separated to allow moulded glass to be removed from the mould cavity, the side portions also including cooling passages passing upwardly through the side portions through which air can pass to cool the side portions, wherein the cooling passages in each side portion each have an entrance in a bottom surface of that side portion and the moulding apparatus further comprises a single plenum chamber extending beneath each of the side portions when the side portions are in the first position and having at least one exit which opens upwardly and communicates, when the side portions are in the first position, through vertical passages in the bottom plate with the entrances of the cooling passages, the plenum chamber also having an entrance connected to air supply means for blowing air into the plenum chamber and valve means for opening and closing the entrance or the at least one exit of the plenum chamber to cause mould cooling air to leave the plenum chamber for a predetermined period while the side portions of the mould are in the first position, said plenum chamber and said at least one exit having dimensions such that while said valve means opens the entrance or the at least one exit, air will be supplied to each cooling passage at substantially the same pressure.

4,701,203

COOLING ARRANGEMENT FOR A GLASS FORMING APPARATUS

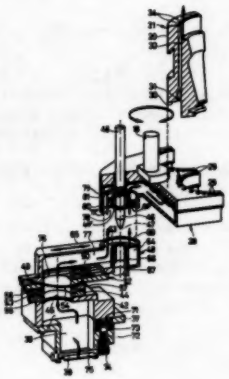
Wilhelm Schneider, Auetal, Fed. Rep. of Germany, assignor to Hermann Heye, Obernkirchen, Fed. Rep. of Germany

Continuation of Ser. No. 599,561, Apr. 11, 1984, abandoned. This application Mar. 20, 1986, Ser. No. 841,597

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313934

Int. Cl.[4] C03B *9/14, 9/16, 9/38, 11/12*

U.S. Cl. 65—265 **14 Claims**



1. A cooling arrangement of a machine for forming molten glass, wherein a forming tool of said machine is coolable by a pressure fluid and turnable about a first pivoting axle, the cooling arrangement comprising at least one stationary supply conduit having means defining an outlet opening; a pressure fluid distributing device for the forming tool turnable relative to said supply conduit about the first pivoting axle; and a connecting conduit to connect each supply conduit with said pressure fluid distributing device, said connecting conduit having an articulated conduit component turnable about a second pivoting axle which is fixed relative to said pressure fluid distributing device and is parallel to the first pivoting axle, said articulated conduit component having an inlet opening which is in a constant communication with said outlet opening of said supply conduit, said articulated conduit component, in addition to its turning about said second pivoting axle, being linearly displaceable along a longitudinal axis thereof relative to said supply conduit in a displacement plane normal to said first and second pivoting axles, and displacement means provided for allowing sliding linear displacement of said articulated conduit component along a longitudinal axis thereof, relative to said supply conduit in a displacement plane normal to said first and second pivoting axles, in addition to said turning of said articulated conduit component about said second pivoting axle.

4,701,204

COMPOSITE COMPRISING A SUBSTRATE COATED WITH POLYMERIC COMPLEXES

Ilan Duvdevani, Leonia; Pacifico V. Manalastas, Edison; Evelyn N. Drake, Lebanon, and Warren A. Thaler, Flemington, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 12, 1985, Ser. No. 808,034

Int. Cl.[4] C05C *9/00*; B32B *5/16, 27/06*

U.S. Cl. 71—28 **12 Claims**

1. A composite comprising:

(a) a substrate; and

(b) a polymeric, elastomeric coating having a Shore Hardness A of at least 75 which is adhered to at least one surface of said substrate, said polymeric, elastomeric coating having a thickness of about 1 to about 100 micrometers, wherein said polymeric coating comprises an interpolymeric complex of a neutralized sulfonated polymer and an amine containing polymer, said neutralized sulfonated polymer having a sulfonate content of about 4 to about 200 meq. per 100 grams of said neutralized sulfonated polymer and said amine containing polymer containing basic nitrogen atoms wherein the basic nitrogen content ranges from about 4 to about 50 meq. per 100 grams of polymer.

4,701,205

CHEMICAL TOBACCO SUCKER CONTROL

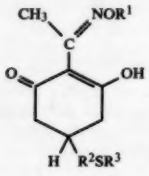
Ahmad Omid, Walnut Creek, and Pawan K. Bassi, Benicia, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Apr. 21, 1986, Ser. No. 854,448

Int. Cl.[4] A01N *31/04*

U.S. Cl. 71—78 **9 Claims**

1. A method for inhibiting the growth of axillary buds in tobacco plants which comprises applying to said tobacco plants or their growth medium an amount effective to inhibit the growth of axillary buds of a growth control agent selected from the group of compounds having the formula:



(I)

wherein R^1 is 3-trans-chloroallyl;

R^2 is alkylidene having 1 to 4 carbon atoms;

R^3 is alkyl having 1 to 4 carbon atoms or phenyl; compatible salts of the compounds of Formula I; and mixtures thereof.

4,701,206

HERBICIDAL SULFONYLUREAS

Werner Töpfl, Dornach, Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

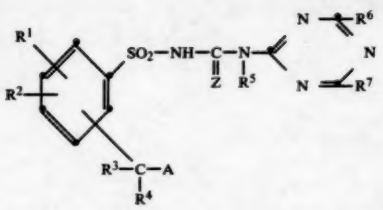
Division of Ser. No. 645,635, Aug. 30, 1984, Pat. No. 4,602,936. This application Apr. 25, 1986, Ser. No. 855,664

Claims priority, application Switzerland, Sep. 9, 1983, 4932/83

Int. Cl.[4] C07D *251/46, 251/52*; A01N *43/66, 43/70*

U.S. Cl. 71—90 **22 Claims**

1. A substituted N-phenylsulfonyl-N'-triazinylurea of the formula



wherein

R^1 is hydrogen, halogen, nitro, cyano, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4alkylsulfonyl, C_1–C_4alkylsulfinyl, —CO—R^8, —NR^9R^{10}, —CO—$NR^{11}R^{12}$ or —SO_2—$NR^{13}R^{14}$,

R^2 is hydrogen, halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4alkylsulfinyl or C_1–C_4alkylsulfonyl,

R^3 is hydrogen, C_1–C_4alkyl, C_1–C_4haloalkyl or cyano,

R^4 is hydrogen or C_1–C_4alkyl,

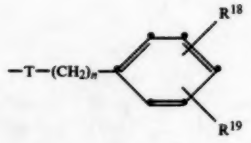
R^5 is hydrogen, C_1–C_4alkyl or C_1–C_4alkoxy,

R^6 and R^7 are each independently hydrogen, halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkyl, C_1–C_4haloalkoxy, C_1–C_4alkylthio, C_1–C_4haloalkylthio, C_2–C_4alkoxyalkyl, C_3–C_6cycloalkyl or —$NR^{15}R^{16}$,

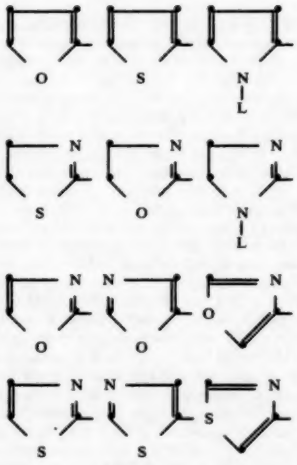
R^8 is hydrogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, C_1–C_4alkylthio or C_2–C_4alkoxyalkoxy,

R^9, R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15} and R^{16} are each independently hydrogen or C_1–C_4alkyl,

A is a radical —Y—$(CH_2)_n$—R^{17} or



R_{17} is a radical selected from



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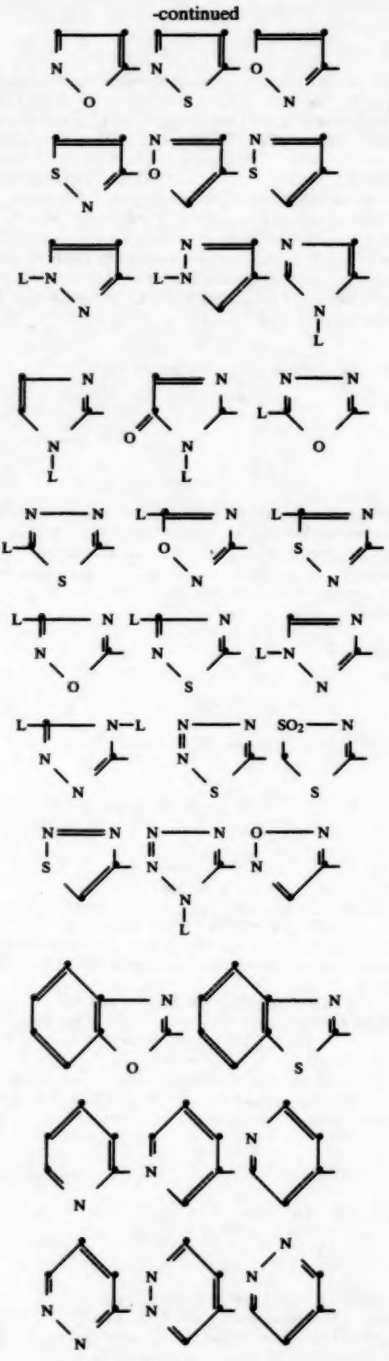

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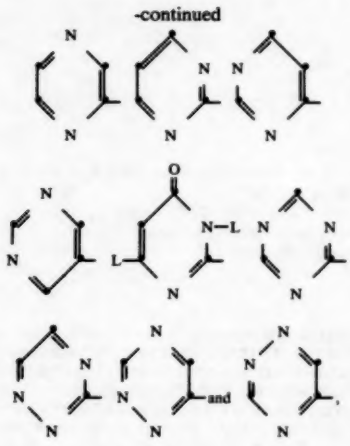


L is hydrogen or C_1–C_4alkyl,

R^{18} and R^{19} are each independently hydrogen, halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4alkoxy, C_1–C_4haloalkoxy, nitro or cyano,

Y is oxygen, sulfur or a direct bond,

T and Z are each independently oxygen or sulfur, and

n is 0 or 1,

or a salt thereof.

18. A method of controlling undesired plant growth, which comprises applying an effective amount of a compound of the formula I according to claim **1**, or of a composition containing such a compound to the plant or the locus thereof.

4,701,207

PHENYL (PHENOXY OR PHENYLTHIO) AZOLOMETHANES

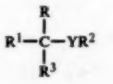
Richard B. Rogers, Concord, and Maria P. Herrero, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 653,399, Sep. 24, 1984, Pat. No. 4,636,514, which is a continuation of Ser. No. 407,852, Aug. 13, 1982, abandoned. This application Aug. 18, 1986, Ser. No. 897,551

Int. Cl.[4] **A61K** *31/415;* **C07D** *249/04*

U.S. Cl. 71—92 **4 Claims**

1. A compound corresponding to the formula



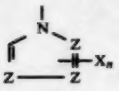
wherein

R represents phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^1 represents phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^2 represents phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;

R^3 represents a 5-membered N-heterocyclic ring of the formula



wherein
each Z independently represents —CH or N and at least one of Z is N;
X is C_1–C_4 alkyl, Br, Cl, F or I and
n represents an integer of from 0 to 3 and
Y is oxygen or sulfur.

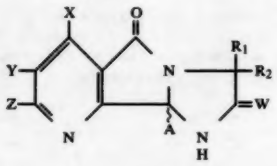
4,701,208

DIHYDROIMIDAZOPYRROLOPYRIDINE, QUINOLINE, THIENO- AND FURO[2,3-b]PYRIDINE, DIHYDROTHIENO- AND FURO]2,3-b]-PYRIDINE, THIENO- AND FURO[3,2-b]PYRIDINE AND DIHYDROTHIENO- AND FURO[3,2-B]PYRIDINE HERBICIDES AND METHOD FOR PREPARATION THEREOF

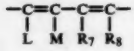
Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 519,603, Aug. 2, 1983, abandoned. This application Jun. 25, 1984, Ser. No. 624,437
Int. Cl.[4] C07D *487/14;* **A01N** *43/40*
U.S. Cl. 71—92 **21 Claims**

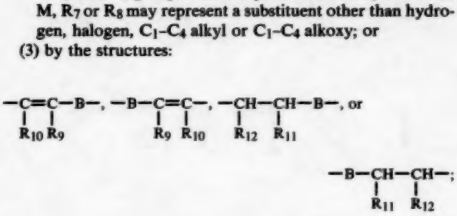
1. A compound having the structure:



wherein
R_1 and R_2 each represent C_1–C_3 alky or cyclopropyl, with the proviso that the sum of the number of carbon atoms in R_1 and R_2 is together with the carbon to which they are attached, they may form a C_3–C_6 cycloalkyl ring optionally substituted with methyl;
W is oxygen or sulfur;
A is hydrogen, hydroxyl, C_3–C_6 alkenyloxy, C_3–C_6 alkynyloxy, C_1–C_6 alkylthio, $NR_{13}R_{14}$ or C_1–C_6 alkoxy optionally substituted with phenyl, halophenyl, C_1–C_3 alkylphenyl, C_1–C_3 alkoxyphenyl or di-C_1–C_3 alkylaminophenyl;
R_{13} is hydrogen, C_1–C_4 alkyl optionally substituted with phenyl, halophenyl, C_1–C_3 alkylphenyl or C_1–C_3 alkoxyphenyl;
R_{14} is hydrogen or C_1–C_4 alkyl;
X is hydrogen, halogen or methyl;
Y and Z are each hydrogen, halogen, C_1–C_6 alkyl, C_1–C_4 hydroxyalkyl, C_1–C_6 alkoxy, C_1–C_4 alkylthio, phenoxy, C_1–C_4 haloalkyl, OCF_2CHF_2, OCF_3, $OCHF_2$, nitro, cyano, NR_4R_5, C_3–C_8 straight or branched alkenyloxy optionally substituted with one to three halogens, C_3–C_8 straight or branched alkynyloxy optionally substituted with one to three halogens, or phenyl optionally substituted with one C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen;
R_4 is hydrogen or C_1–C_4 alkyl;
R_5 is C_1–C_4 alkyl; And, when taken together, Y and Z may form a ring in which YZ is represented by
(1) the structure: $—(CH_2)_n—$, where n is an integer of 2, 3 or 4, provided that X is hydrogen; or
(2) by the structure:



where, L, M, R_7 and R_8 each represent hydrogen, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, C_1–C_4 haloalkyl, NO_2, CN, phenyl, phenoxy, amino, OCF_3, $OCHF_2$, OCF_2CHF_2, C_1–C_4 alkylamino, dialkyl(C_1–C_4)amino, chlorophenyl, methylphenyl, C_3–C_8 straight or branched alkenyloxy optionally substituted with one to three halogens, C_3–C_8 straight or branched alkynyloxy optionally substituted with one to three halogens, or phenoxy substituted with one Cl, CF_3, NO_2 or CH_3 group, with the proviso that only one of L, M, R_7 or R_8 may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy; or
(3) by the structures:



where B is oxygen or sulfur; R_9 and R_{10} each represent hydrogen, halogen, phenyl, or C_1–C_4 alkyl; R_{11} and R_{12} each represent hydrogen, C_1–C_4 alkyl or phenyl;
and when R_1 and R_2 are not the same, the cis- or trans-isomers or mixtures thereof or the optical isomers (cis- or trans- or mixtures thereof).

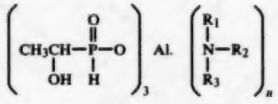
4,701,209

ALUMINUM PHOSPHINATE-AMINE ADDUCTS, AND THEIR PRODUCTION AND USE

Mitsuru Sasaki, and Yukio Oguri, both of Toyonaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 22, 1986, Ser. No. 865,967
Claims priority, application Japan, Jun. 5, 1985, 60-121946
Int. Cl.[4] C07F *5/06;* **A01N** *55/02*
U.S. Cl. 71—97 **9 Claims**

7. A composition for prevention or treatment of plant diseases caused by phytopathogenic fungi which comprises an effective amount of an adduct of the formula:



wherein R_1, R_2 and R_3 are each a hydrogen atom, a lower alkyl group, a lower alkoxy(lower)alkyl group, a lower alkylthio(-lower)alkyl group or a cyclo(lower)alkyl group and n is a number of 0.5 to 2.0, and an inert carrier or diluent.

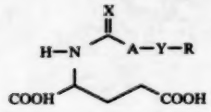
4,701,210

N-SUBSTITUTED GLUTAMIC ACID DERIVATIVE AND PROCESS FOR PRODUCTION AND USE THEREOF

Takaharu Tanaka, Osaka; Naoki Higuchi, Ikeda; Masayuki Saito, and Masaki Hashimoto, both of Ibaraki, all of Japan, assignors to Suntory Limited, Osaka, Japan

Filed Jun. 17, 1986, Ser. No. 875,079
Claims priority, application Japan, Jun. 18, 1985, 60-130811
Int. Cl.[4] A01N *37/24*
U.S. Cl. 71—98 8 Claims

1. An N-substituted glutamic acid having the following general formula (I):



(I)

wherein X and Y represent, independently, an oxygen atom or a sulfur atom; a group —A— represents a methylene group, ethylene group, or ethylidene group; R represents a chlorotolyl group, dimethylphenyl group, chlorotrifluoromethylphenyl group, chloromethyloxyphenyl group, naphthyl group, tolyl group, trifluoromethyl phenyl group, iodophenyl group, fluorophenyl group, or chlorophenyl group; with a proviso that if both X and Y represent an oxygen atom and the group —A— represents a methylene group, R represents a group other than a p-chlorophenyl group, p-iodophenyl and p-fluorophenyl, and the sodium, potassium, lithium and ammonium salts thereof.

3. A herbicidal composition comprising an effective amount of an N-substituted glutamic acid derivative of claim 1 or the sodium, potassium, lithium or ammonium salts thereof, and a conventional carrier for herbicide.

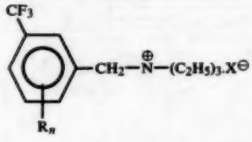
4,701,211

SUBSTITUTED BENZYLTRIETHYLAMMONIUM SALTS AND THEIR USE AS PLANT GROWTH ENHANCERS

Joseph E. Dunbar, Midland, Mich.; Theodore W. Holmsen, Clayton, Calif., and Herman O. Senkbeil, Beaverton, Mich., assignors to The Dow Chemical Company, Midland, Mich.

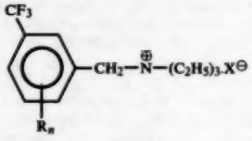
Continuation of Ser. No. 525,338, Aug. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 405,674, Aug. 6, 1982, abandoned. This application Jun. 18, 1985, Ser. No. 746,142
Int. Cl.[4] A01N *33/12*; C07C *87/30*
U.S. Cl. 71—121 20 Claims

1. A compound corresponding to the formula



wherein R represents hydrogen or trifluoromethyl; n represents an integer of from 1 or 2, with the proviso that when R is trifluoromethyl, n is 1; and X represents a non-phytotoxic anion.

12. A method for enhancing the growth of plants to obtain an increase in weight or size of said plants which comprises contacting plants or plant parts or their habitat with a growth enhancing amount of a composition containing as the active material a compound corresponding to the formula



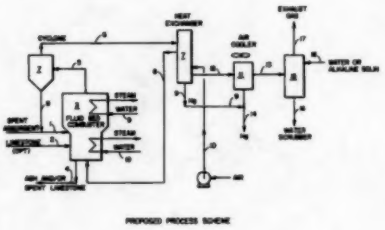
wherein R represents hydrogen or trifluoromethyl; n represents an integer of from 1 or 2, with the proviso that when R is trifluoromethyl, n is 1; and X represents a non-phytotoxic anion in admixture with an inert carrier therefor.

4,701,212

RECOVERY OF MERCURY AND HEAT ENERGY FROM WASTE USING FLUIDIZED BEDS

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 25, 1986, Ser. No. 911,550
Int. Cl.[4] C22B *1/10*
U.S. Cl. 75—26 7 Claims



PROPOSED PROCESS SCHEME

1. A method for converting a mercury contaminated carbon sorbent for safe disposal and for recovering mercury comprising:

(a) oxidizing said material in a fluidized bed under conditions sufficient to effect oxidation of the carbon sorbent and sulfur present in the absorbent;

(b) removing the hot overhead gases to a cooling means and condensing mercury therefrom; and

(c) recovering and disposing of a solid mercury-free residue.

4,701,213

REDUCTION OF IRON ORE CONCENTRATES WITH MAGNESIUM OR ALUMINUM

Kenneth R. Judkins, 17 Floyd Cir., and Michael D. Osmundson, 38 Field Rd., both of Silver Bay, Minn. 55614

Filed Dec. 26, 1985, Ser. No. 813,405
Int. Cl.[4] C21B *15/02*
U.S. Cl. 75—27 3 Claims

1. A continuous process for the direct reduction of iron ore concentrates to produce a product of high purity elemental iron of a purity greater than 99 percent of elemental iron comprising:

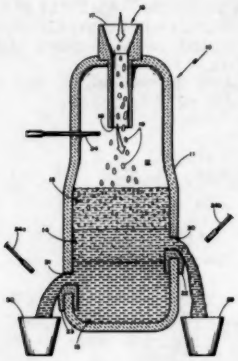
(a) preparing a reactant mixture of particulate solids comprising iron ore concentrates and a reductant metallic element having an electromotive activity substantially greater than iron and selected from the group consisting of magnesium and aluminum;

(b) substantially continuously introducing said reactant mixture at a predetermined rate into the reduction-reaction zone of an elongated generally vertically disposed refractory lined reactant vessel and wherein said reaction vessel includes a reduction reaction zone adjacent the upper end portion thereof and a molten iron retaining and removal zone adjacent the lower portion thereof;

(c) heating said reactant mixture to an elevated temperature within said reduction reaction zone through oxidation of said reductant metallic element and reduction of said iron ore concentrates within said reduction zone until said reactant mixture becomes ignited and becomes at least semi-molten;

(d) creating a series of layers of molten material within said reactant vessel at an elevation below said reduction reaction zone and including a base layer of molten highly purity elemental iron, a superposed intermediate layer of molten slag, and an upper mixed layer of said semi-molten reactant mixture; and

(e) substantially continuously tapping reactant product from said reaction vessel along a generally vertically disposed



wall thereof through a plurality of ports arranged at vertically spaced apart locations therealong at a rate substantially equal to said predetermined rate so as to maintain the molten level within said reactant vessel substantially constant, and with at least one of said ports being disposed at an elevation for withdrawing molten high purity elemental iron product from said metallic product retaining zone, and with at least one other of said ports withdrawing molten slag from said molten product retaining zone, with the withdrawal rates for said molten slag and said molten high purity elemental iron product each being selected to provide for the continuous maintenance of said layers of semi-molten reactant, molten slag, and molten high purity elemental iron.

4,701,214

METHOD OF PRODUCING IRON USING ROTARY HEARTH AND APPARATUS

Dentaro Kaneko, Matthews, and David C. Meissner, Charlotte, both of N.C., assignors to Midrex International B.V. Rotterdam, Zurich, Switzerland

Filed Apr. 30, 1986, Ser. No. 857,684
Int. Cl.[4] C21B *13/08*; F27B *3/06*
U.S. Cl. 75—38 **24 Claims**

1. Apparatus for making iron from finely divided iron ores, comprising:

a. means for agglomerating finely divided iron ore and particulate carbonaceous material to form compacts;

b. a rotary hearth furnace for prereducing said compacts therein;

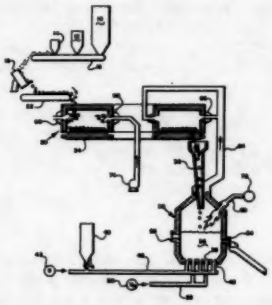
c. means for introducing said compacts to said rotary hearth furnace;

d. means for heating and prereducing said compacts within said rotary hearth furnace;

e. means for discharging said prereduced compacts from said rotary hearth into a smelting reduction vessel at a temperature of at least 1000° C.;

f. a smelting reduction vessel;

g. means for introducing finely divided carbonaceous material into said vessel beneath the surface of the bath therein;



h. means for removing an off-gas from said smelting reduction vessel; and

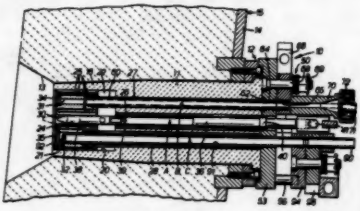
i. means for introducing all of said off-gas to said rotary hearth furnace as process gas for heating and prereducing said compacts.

4,701,215

APPARATUS FOR INTRODUCING SUBSTANCES INTO LIQUIDS E.G. METAL MELTS

Kenneth W. Bates, and William A. Griffiths, both of Chesterfield, Great Britain, assignors to Injectall Limited, Sheffield, England

Continuation of Ser. No. 629,782, Jul. 10, 1984, Pat. No. 4,575,393. This application Feb. 18, 1986, Ser. No. 830,642
Claims priority, application United Kingdom, Nov. 23, 1982, 9233300; Apr. 21, 1983, 8310814, Jun. 1, 1983, 8315025
Int. Cl.[4] C21C *7/00*
U.S. Cl. 75—53 **8 Claims**



1. A wire injection obturator for use in an injection device having a tubular passage for guiding a wire or rod of an alloying substance into a metal melt, the obturator being positioned between the wire or rod and the metal melt, said obturator comprising a metal body having a solid cylindrical nose portion of a predetermined cross-sectional shape and size, and at least three resilient legs integral therewith, the legs extending axially away from the nose portion and diverging from one another for frictionally engaging the tubular passage at their ends.

4,701,216

MELTING OF METALS

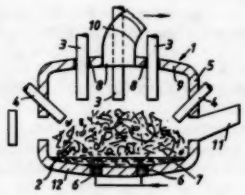
Gene D. Spenceley, Tamebridge, and Brian C. Welbourn, Whitby, both of England, assignors to British Steel Corporation, London, England

Filed Jun. 20, 1986, Ser. No. 876,818

Claims priority, application United Kingdom, Jun. 26, 1985, 8516143

Int. Cl.[4] C21C 5/32, 5/34

U.S. Cl. 75—59.1 12 Claims



1. A method of melting and superheating ferrous material comprising the steps of charging a vessel with ferrous material and injecting into the vessel coal and oxygen in such ratios as to combust the coal to provide adequate heat for the melting of the ferrous material and to provide residual carbon in the melt to superheat the melt upon oxidation of the carbon.

4,701,217

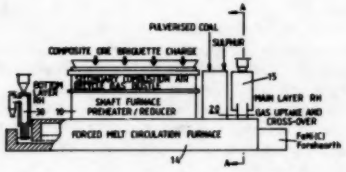
SMELTING REDUCTION

Noel A. Warner, Rednal, England, assignor to University of Birmingham, Birmingham, England

Filed Nov. 6, 1986, Ser. No. 927,548

Int. Cl.[4] C22B 5/02

U.S. Cl. 75—92 22 Claims



1. A method of smelting metal oxide material comprising the steps of forcibly circulating molten carrier material in a closed loop path serially through a smelting reduction zone, a slag separation zone and a heating zone; contacting the metal oxide material with the molten carrier material; introducing a carbonaceous reductant to the molten carrier material; at least partially reducing said metal oxide to metal by the carbonaceous reductant in said smelting reduction zone, the metal oxide and carbonaceous reductant being utilized in proportions such that the carbon from the carbonaceous reductant is converted to carbon monoxide; reacting the carbon monoxide with oxygen in the heating zone at the surface of the molten carrier material so that heat generated by the reaction is transferred to the molten carrier material; separating slag from said molten carrier material in said slag separation zone before the molten carrier material is circulated to the heating zone so that the surface of the molten carrier material which is circulated to the heating zone is substantially free of slag; and recovering said metal.

4,701,218

COMPOSITIONS COMPRISING INORGANIC PARTICLES

Martyn C. Barker, Henley-on-Thames, and Edward G. Rowlands, Reading, both of England, assignors to Johnson Matthey Public Limited Company, London, England

Continuation of Ser. No. 495,120, May 16, 1983, abandoned. This application Mar. 28, 1986, Ser. No. 845,484

Claims priority, application United Kingdom, May 14, 1982, 8214174

Int. Cl.[4] B22F 9/18

U.S. Cl. 106—114 24 Claims

1. A dry, free-flowing floccular composition comprising

(a) ultrafine inorganic particles in which the maximum dimension of a major proportion of the particles is from 0.5 to 3000 nm,

(b) a particulate size-stabiliser in combination with the particles, the size-stabiliser comprising a lyophobic core and a lyophilic surface and wherein the size-stabiliser is sufficiently impermeable to said liquid dispersant to prevent a reduction of more than 5% in the volume of the size-stabilizer on removal of the size-stabilizer from a dispersion of the size-stabilizer in said liquid dispersant and a flocculating agent which comprises a polyelectrolyte attached to the combination of size-stabiliser and ultrafine particles, the lyophobic/lyophilic size-stabiliser (b) functioning to resist agglomeration of the ultrafine particles during formation of the composition and during its mixing into viscous molten plastic materials which would normally cause agglomeration and the flocculating agent (c) functioning by attachment to particles (a) or a combination of (a) and (b), to cause flocculation of said particles with said size-stabiliser.

4,701,219

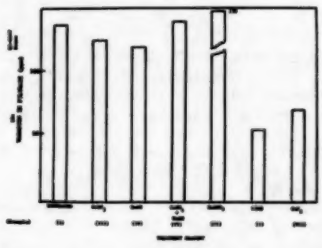
INHIBITING LEACHING OF METALS FROM CATALYSTS AND SORBENTS AND COMPOSITIONS AND METHODS THEREFOR

Joseph C. Bonee, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 349,280, Feb. 8, 1982, abandoned. This application May 30, 1986, Ser. No. 870,653

Int. Cl.[4] C04B 2/02

U.S. Cl. 106—118 7 Claims



1. In a process for treating waste particulate matter having a metal selected from the group consisting of vanadium, nickel and a mixture of vanadium and nickel deposited thereon during hydrocarbon treatment processes, to substantially stabilize against leaching of said metal by rain and ground waters, the improvement consisting essentially of mixing said waste particulate matter with a treating agent selected from the group consisting of lime, calcium fluoride, and calcium hydroxide, in an amount of from about 1% to about 12% by weight based on the weight of said waste particulate matter, to stabilize said metal against said leaching, wherein said waste particulate matter is spent catalyst from a petroleum catalytic cracking process or sorbent from a process for removing said metal from

residual fractions derived from crude oil, whereby said waste particulate matter can be then discarded in a landfill.

4,701,220

ONE-COMPONENT FORMULATION FOR PRECIPITATING, DETACKIFYING AND COAGULATING UNDERSEAL

Hans-Peter Seng, Süssen, Fed. Rep. of Germany, assignor to Zeller+Gmelin GmbH & Co., Eislingen, Fed. Rep. of Germany

Filed Jun. 7, 1985, Ser. No. 742,513
Int. Cl.[4] C08L *1/00, 5/00*
U.S. Cl. 106—203 **3 Claims**

1. The one-component formulation for precipitating, detackifying and coagulating underseal based on wax, wax-like plastic and plastic dispersions, and synthetic resin paint in an aqueous mixture to obtain a sedimenting paint sludge comprising an additive which envelops paint particles, said additive being an aqueous suspension of hydrated marble lime, wherein the suspension of hydrated marble lime contains a mixture of a blend containing cellulose and montmorillonite, smectite or combination thereof, and the condensation product of sodium salts of naphthalenesulfonic acid.

4,701,221

PROCESS FOR THE PRODUCTION OF BLACK PIGMENTS BASED ON IRON

Horst Brunn, Meerbusch; Gerd-Hermann Schulten, Duisburg, and Werner Fuhr, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 9, 1986, Ser. No. 861,453
Claims priority, application Fed. Rep. of Germany, May 21, 1985, 3518093
Int. Cl.[4] C04B *3/00, 14/00*
U.S. Cl. 106—304 **10 Claims**

1. A process for the production of black iron oxide pigments having a magnetite structure from iron ion-containing acidic waste water which comprises forming a precipitate of iron ions in a ratio of iron(III)/iron(II) of 1.0 to 2.4 with alkaline substances at pH greater than 8 in a first stage at ambient temperature to produce a raw slurry and, in a second stage, concentrating the raw slurry adjusted to a pH of from 5.0 to 8.0 with acidic substances and then ripening the concentrated slurry at temperatures above 70° C.

4,701,222

PROCESS FOR PRODUCING AN ARTIFICIAL LIGHT-WEIGHT AGGREGATE

Waichi Kobayashi; Seiji Akegi, and Kazuhiro Iwata, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Jan. 14, 1986, Ser. No. 818,875
Claims priority, application Japan, Jan. 14, 1985, 60-5257
Int. Cl.[4] C04B *18/06*
U.S. Cl. 106—288 B **7 Claims**

1. A process for producing an artificial lightweight aggregate comprising SiO_2, Al_2O_3, Fe_2O_3 and at least one oxide selected from the group consisting of MgO and CaO which has an absolute dry specific gravity of not higher than 1.5, a crushing strength of not less than 55 kgf/cm^2 and a 24 hour water-absorption ratio of not greater than 2.4%, which comprises:

granulating a raw powder material comprising SiO_2, Al_2O_3, Fe_2O_3 and at least one oxide selected from the group consisting of MgO and CaO, in which the total amount of SiO_2 and Al_2O_3 is from 75 to 92 wt.%, the weight ratio of Al_2O_3/SiO_2 is from 0.25 to 0.70, and the total amount of Fe_2O_3 and MgO and/or CaO is from 6–20 wt.% and containing at least 80% by weight of a coal ash having a Blaine specific surface area of 2,000 to 9,000 cm^2/g to give granules having an average apparent specific gravity of 1.1 to 1.8 and a crushing strength of 0.5 kgf/cm^2 or above at 20° C. as well as after heating at 600° C.; and

calcining the granules at a temperature of 1,100° to 1,600° C. by heating the granules to said temperature at a rate of 150° C./hour to 1000° C./hour when heating said granules from 600° C. to said temperature.

4,701,223

LIQUID DENTURE CLEANSER COMPOSITION AND METHOD OF APPLICATION

Anthony B. J. Eoga, Boonton, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 684,818, Dec. 20, 1984, abandoned. This application Apr. 28, 1986, Ser. No. 856,715
Int. Cl.[4] C11D *1/02*
U.S. Cl. 134—2 **20 Claims**

1. A storage stable liquid denture cleanser composition consisting essentially of

(a) a detergent present in amounts of about 3 to about 18% by weight selected from the group consisting of sulfonate fatty alcohols having the formula $ROSO_3M$, sulfated fatty alcohols having the formula $ROSO_4M$, sulfoacetates having the formula $ROCOCH_2SO_3M$ and mixtures thereof, wherein R is C_{10-16}, M is a water soluble alkali metal or alkaline earth metal; and

(b) a water-soluble chelating agent present in amounts of about 3 to about 18% by weight selected from the group consisting of amino carboxylate, organo phosphonates and mixtures thereof; and

(c) water present in amounts of about 50 to about 94% by weight.

4,701,224

WATER SOLUBLE CONDENSATION SOLDERING FLUX

Frank M. Zado, Lawrence Township, Mercer County, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 21, 1986, Ser. No. 854,462
Int. Cl.[4] B23K *35/34*
U.S. Cl. 148—23 **9 Claims**

1. In the process of condensation soldering for solder, fusing or brazing an article, the step consisting essentially of applying a mildly acidic resinated polyene flux to the article, said flux comprising a water soluble flux vehicle, at least one water soluble flux activator and a water miscible solvent therefor, said vehicle comprising a resinated adduct of a polyene derived from the condensation of an alkylene oxide with a conjugated polycyclic amine.

4,701,225

PROCESS FOR THE HEAT TREATMENT OF A URANIUM ALLOY MEMBER

Jean-Michel Morey, Saint Seine l'Abbaye, and Gilles Paradis, St. Apollinaire, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 16, 1986, Ser. No. 908,004
Claims priority, application France, Sep. 25, 1985, 85 14202
Int. Cl.[4] C21D *1/00*
U.S. Cl. 148—132 **10 Claims**

1. A process for the heat treatment of a uranium alloy member in order to obtain different properties between skin and core, wherein said process comprises the following successive stages:

(a) γ-phase homogenization,

(b) induction heating,

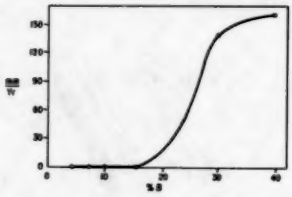
(c) hardening.

4,701,226

CORROSION RESISTANT AMORPHOUS CHROMIUM-METALLOID ALLOY COMPOSITIONS

Richard S. Henderson, Solon; Gary A. Shreve, Euclid, and Michael A. Tenbover, Solon, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jul. 15, 1985, Ser. No. 755,250
Int. Cl.[4] C22C 27/06
U.S. Cl. 148—403 8 Claims



1. Amorphous metal alloy of the formula:

ti $Cr_{1-x}M_x$

wherein

M is one element selected from the group consisting of B, C, P, N. S, Sb and As; and

when M is B, x ranges from about 0.04 to about 0.16.,

when M is C, x ranges from about 0.04 to about 0.20, and

when M is P, N. S, Sb and As, x ranges from about 0.04 to about 0.30.

4,701,227

AMMONIUM NITRATE EXPLOSIVE COMPOSITIONS

Nicholas P. Loverro, Jr., 318 Brigette Ct., Redlands, Calif. 92374

Filed Feb. 5, 1987, Ser. No. 11,086
Int. Cl.[4] C06B 31/32
U.S. Cl. 149—47 20 Claims

1. A method for desensitizing explosive compositions based upon ammonium nitrate which consists essentially of incorporating a desensitizing amount of a polyethyleneimine into said composition.

4,701,228

PROCESS FOR THE MANUFACTURE OF A DOUBLE-BASE PROPELLENT COMPOSITION WITH LOW FLAME-GLARE EMISSION

Richard Lagreze, La Couronne, and Georges Malescot, Angouleme, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Oct. 7, 1986, Ser. No. 916,308
Claims priority, application France, Oct. 14, 1985, 85 15170
Int. Cl.[4] D03D 23/00
U.S. Cl. 149—109.6 10 Claims

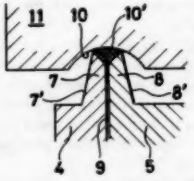
1. Process for the manufacture, by the casting method, of a double-base propellant composition exhibiting specific energy in Joules higher than 3330, free from post-combustion and containing ballistic additives which consists of casting a nitrocellulose-based molding powder with a casting solvent based on a nitrated oil, wherein the molding powder consists of a mixture of at least two powders, one of which, the first powder, contains anti-glare agents, and the second powder is free of antiglare agents, the first powder contains at most 20% by weight of antiglare agents, the weight ratio of said first powder to said second powder in the molding powder being between 50:50 and 15:85.

4,701,229

METHOD OF HIGH FREQUENCY WELDING

Masaru Arakawa, Chigasaki, and Masanori Numata, Hayamamachi, both of Japan, assignors to Nifco Inc., Yokohama, Japan

Filed Feb. 19, 1986, Ser. No. 832,031
Claims priority, application Japan, Feb. 21, 1985, 60-31417
Int. Cl.[4] B29C 65/08; B65B 7/28
U.S. Cl. 156—69 1 Claim



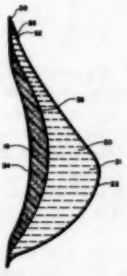
1. A method of high frequency welding comprising the steps of: providing two plastic workpieces to be welded together with concentric axially upstanding respective ribs having lateral annular surfaces facing each other and extending to the same height, each rib having a top, said ribs having outer surfaces opposite the facing surfaces which are inclined such that the thicknesses of said ribs decrease toward their tops; and applying high frequency vibration to said ribs by positioning a high frequency welder horn such that the bottom of an annular groove of said horn having an arcuate sectional profile is pressed axially against the tops of said ribs to melt said ribs at and adjacent said tops and to centralize the melted material over said facing surfaces, said ribs of the two plastic workpieces being disposed such that a slight gap is formed between their facing surfaces and the melted material, due to said arcuate sectional profile of said annular groove and the inclination of said outer surfaces, does not spread to said outer surfaces of said ribs and is pressed between said facing surfaces.

4,701,230

METHOD FOR MANUFACTURING A BREAST PROSTHESIS

Chay H. Loi, Monterey Park, Calif., assignor to Nearly Me, Los Angeles, Calif.

Filed Jul. 18, 1985, Ser. No. 757,135
Int. Cl.[4] A61F 2/50
U.S. Cl. 156—145 1 Claim



1. A method of forming a prosthesis comprising the steps of: providing a foam member having a convex and a concave surface;

shaping an intermediate skin sheet of thin, flexible material and molding the intermediate skin sheet upon the convex

surface of the foam member whereby the intermediate skin sheet adheres to the convex surface of the foam member;

shaping an outer skin sheet of thin, flexible material on a mold of parti-cylindrical configuration corresponding to a human breast and having the desired exterior shape and appearance of the prosthesis;

positioning the intermediate skin sheet and foam member combination within the outer skin sheet;

shaping and positioning an inner skin sheet of thin flexible material in intimate contact with the concave surface of the foam member;

sealing with the inner skin sheet, the foam member and intermediate skin sheet combination and the outer skin sheet together about the peripheries thereof, thereby forming a combination having a cavity defined by the intermediate skin sheet and the outer skin sheet;

filling the cavity with a liquid through a passage in the outer skin sheet;

removing any air trapped within the cavity;

sealing the passage;

curing the liquid into a gel;

providing a mold for said foam member, and pouring and curing a foam material into the mold; and

wherein the step of providing a foam member further includes the step of heating the mold prior to the pouring step, thereby causing that portion of the foam member adjacent to the mold to have greater porosity than the remainder thereof and less density.

4,701,231

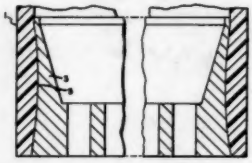
METHOD OF FORMING A JOINT BETWEEN A TUBULAR COMPOSITE AND A METAL RING

Stanley T. Peters, Mt. View; Robert L. Kolek, Cupertino; Rolf A. Guenther, Monte Sereno; Jeffrey J. Anderson, Mt. View, all of Calif., and Clarence F. Marshall, Scottsdale, Ariz., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1986, Ser. No. 863,484

Int. Cl.[4] B31C *13/00*; **F16D** *1/06*

U.S. Cl. 156—172 **8 Claims**



1. A method of making a composite to metal joint between a metal ring and a tubular composite material formed from continuous strands of high strength fibers wound in crossing helical windings which are bonded by a resinous binder to form the tubular composite structure, said method comprising the steps of:

winding the fiber on a generally cylindrical surface of a mandrel at a helical angle equal to or greater than the slip angle of the fiber, and

providing the metal ring with a surface in the form of a hyperboloid of one sheet, the metal ring being positioned on the mandrel, said hyperboidal surface being so proportioned that the winding angle of the fiber on the hyperboloidal surface and on the cylindrical surface of the mandrel are equal and winding the fibers to extend in generally straight lines over the hyperboloidal surface hugging the hyperboloidal surface on the metal ring with substantially no bridging.

4,701,232

METHOD OF MANUFACTURING STRUCTURAL ELEMENTS

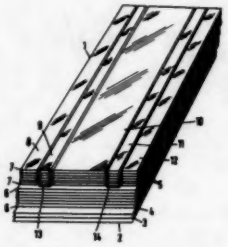
Willy Werres, Darmstadt, Fed. Rep. of Germany, assignor to Resopal Werk H. Römmler GmbH, Mannheim, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 860,678

Claims priority, application Fed. Rep. of Germany, May 10, 1985, 3516862

Int. Cl.[4] B29C *53/04*; **B32B** *27/42, 31/20*

U.S. Cl. 156—211 **5 Claims**



1. Method of manufacturing structural elements from decorative laminated molding materials, which comprises forming an outer layer from a plurality of mutually separate and directly adjacent stacks of soda kraft papers stacked on top of each other and impregnated with phenol resin, forming a core from an inner layer and the outer layer, separating at least one of the stacks from adjacent stacks and from the inner layer by a wrapping formed of a material from the group consisting of polypropylene, polyamide and polyethylene, placing a decorative layer on the inner layer of the core, pressing the core and the decorative layer together, forming at least one recess in the outer layer by removing at least one of the separated stacks, and deforming the structural element along the at least one recess after pressing.

4,701,233

METHOD FOR FOLDING AND SEALING SHEETS

Christian A. Beck; Marc C. Breslawsky, both of Ridgefield, and Hans R. Forster, Nichols, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 16, 1986, Ser. No. 819,449

Int. Cl.[4] B29C *53/00*; **B65B** *1/04*; **B31F** *1/00*

U.S. Cl. 156—217 **5 Claims**

1. A method of folding and sealing a sheet having parallel lateral edges, comprising:

(a) feeding said sheet forward along a path for folding and sealing said sheet upon itself;

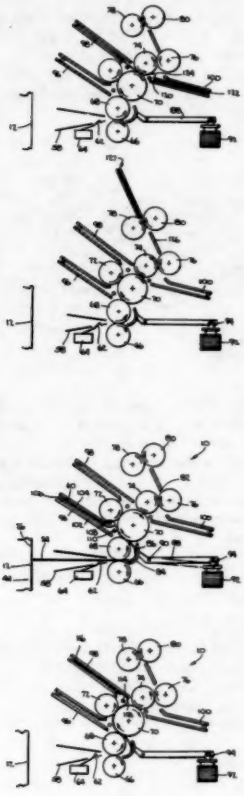
(b) while so feeding said sheet, buckling said sheet in a first localized area to form a first bulge;

(c) while continuing to so feed said sheet, applying an adhesive within the first bulge parallel with said latertal edges;

(d) forming a first fold in the first bulged portion of the sheet as the sheet is progressively advanced along said path;

(e) bringing the inner surfaces of the first bulged portion rearward of the first fold into contact with each other,

thereby causing said inner surfaces of said first bulge to adhere to each other; and



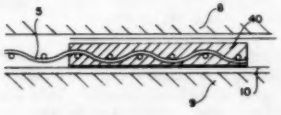
(f) continuing the feeding of said sheet with the formed fold as the new leading edge of the sheet.

4,701,234

PROCESS FOR THE MANUFACTURE OF AN INTERPOSED SUPPORT OF SEMIPERMEABLE MEMBRANES

Jean Rogemont, Saint Chamond, and Andre Nouvet, Saint Heand, both of France, assignors to Cefilac, Paris, France

Filed Apr. 10, 1986, Ser. No. 850,114
Int. Cl.[4] B44C *1/16*; B32B *31/00, 23/02*
U.S. Cl. 156—230 **13 Claims**



1. Process for the manufacture of an interposed support of semi-permeable membranes, comprising a permeable mesh having a sealed border of elastomeric material, comprising the following steps:

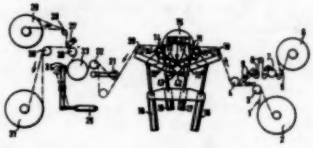
(a) depositing a raw elastomer film on a transfer support;
(b) cutting the film on the support into at least one element wherein the elastomer has the configuration of said border;
(c) applying said at least one element on one side of a permeable mesh, with said elastomer turned toward the mesh;
(d) treating said at least one element applied to said mesh at a temperature of between 100 and 150° C., at a pressure and for a time sufficient to cause the elastomer to penetrate into the mesh, to polymerize said raw elastomer and to form a border on each side of the mesh which is smooth; and
(e) removing said transfer support from the polymerized elastomer to produce a support having a border with surfaces that are smooth, continuous, and sealable to the border of another said support without the use of adhesive.

4,701,235

METHOD FOR APPLYING AN EMBOSSING FOIL TO A FLEXIBLE MATERIAL

Reinwald Mitsam, Zirndorf, Fed. Rep. of Germany, assignor to Messrs. Leonhard Kurz, Fed. Rep. of Germany

Continuation of Ser. No. 476,192, Mar. 17, 1983, abandoned. This application Jun. 6, 1985, Ser. No. 742,216
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210551
Int. Cl.[4] B44C *1/16, 1/17*; B32B *31/00*
U.S. Cl. 156—233 **4 Claims**



1. An improved method for applying an embossing foil to a flexible material, which comprises:
bringing said embossing foil and said flexible material together to form a foil-material assembly;
passing said foil-material assembly over a heated support surface;
pressing and maintaining said foil-material assembly against said heated support surface over a substantial distance thereof at a plurality of pressure-applying locations spaced along said heated support surface in direction of movement of said foil-material assembly during passage thereof over said heated support surface to maintain uniform heating of said foil-material assembly thereby to emboss a decorative layer on said flexible material;
cooling said thus heated foil-material assembly; and
removing a backing member of foil from said cooled foil-material assembly to leave said decorative layer on said flexible material.

4,701,236

METHOD OF MANUFACTURING AN ELECTRONIC IDENTIFICATION CARD

Gérard Vieilledent, Grossoeuvre, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1986, Ser. No. 847,987
Claims priority, application France, Apr. 12, 1985, 8505518
Int. Cl.[4] B32B *31/04, 31/08, 31/10, 31/12*
U.S. Cl. 156—252 **8 Claims**

1. A method of manufacturing an electronic identification card with at least one integrated circuit chip wherein the chip is mounted in a cavity in a carrier film having conductor tracks, said carrier film being cut to form a section which

supports said chip, said section to be disposed in a recess provided in the card, the dimension of said recess corresponding to that of said section, said method including sticking a first side of an adhesive tape with adhesive on both sides to said section of said carrier film, said tape having a removable protective layer stuck to its second side, having formed therein an aperture in said tape and its protective layer which aperture is

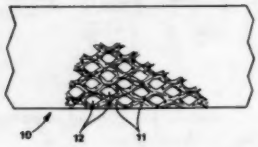
larger than said cavity but smaller than said recess, said aperture being disposed over said cavity to render said chip accessible through said aperture, applying varnish to said tape and said chip and removing said protective layer and the varnish covering it to expose the adhesive on the second side of said adhesive tape whereby said section can be pressed into and held in said recess by said second side of said adhesive tape.

4,701,237

WEB WITH ENHANCED FLUID TRANSFER PROPERTIES AND METHOD OF MAKING SAME

Frederich O. Lassen, Winnebago County, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 542,332, Oct. 17, 1983, Pat. No. 4,608,292.
This application Jun. 5, 1986, Ser. No. 871,052
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—252 **8 Claims**



1. A method for forming a web from a fibrous mass said web containing a thermoplastic component and fibers generally aligned in the machine direction said web including spaced apertures comprising:

(a) depositing a fibrous mass containing a fusible component to form a web;

(b) slitting said web in a discretely spaced predetermined pattern;

(c) tensioning said web in the machine and cross directions to fibrillate said web to form said spaced apertures; and

(d) fixing said web with said apertures by heating and then lowering the temperature of said thermoplastic components.

4,701,238

WRAPPING MACHINE

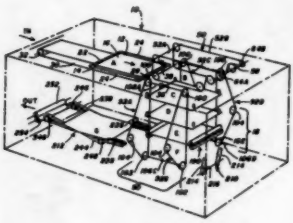
Ronald H. Boucher, Manchester, N.H., assignor to Crathern Engineering Co., Inc., Contoocook, N.H.

Filed Oct. 27, 1986, Ser. No. 923,679
Int. Cl.[4] B32B *3/04*
U.S. Cl. 156—479 **27 Claims**

1. Apparatus for folding and securing the edges and corners of a relatively flexible, larger sheet over the corresponding edges and corners of at least one relatively rigid, smaller blank so as to substantially maintain the contour of the corners, wherein the blank includes at least one rounded corner and prior to folding and securing the edges and corners the sheet is provided with an adhesive coating on one side of the sheet, said one side of said sheet is secured to the blank so as to form a laminate, and the edges and corners of the sheet extend beyond the corresponding edges and corners of the blank, said apparatus comprising:

means for transporting said sheet and blank to a work station, wherein said sheet and blank are positioned at said work station as said laminate;

means for folding and securing a first portion of the part of said sheet over the edge of said blank near said rounded



corner, while lifting a second portion of said part of said sheet adjacent said first portion so as keep said second portion from contacting said blank;

means for folding and securing said second portion of said part of said sheet over the corresponding portion of the edge of said blank near said rounded corner so that a part of said second portion covers at least a part of said first portion; and

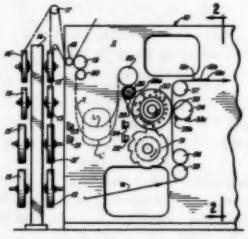
means for folding the remaining portions of the edges of said sheet over the corresponding edges of said blank.

4,701,239

APPLICATOR FOR APPLYING TWO OR MORE TAPES TO A MOVING WEB

Grantland A. Craig, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Oct. 15, 1985, Ser. No. 787,467
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—519 **5 Claims**



1. A tape advancing, cutoff, and transport apparatus for a disposable diaper or the like comprising:

a frame,

first supply roll means operatively associated with said frame for supplying an adhesively coated continuous tape,

second supply roll means operatively associated with said frame for supplying a continuous release tape,

guide means on said frame to direct said adhesive and release tapes in superposed relation through a nip to feed and adhesively join said tapes, the width of the release tape being less than the width of the adhesive tape whereby a portion of the adhesive is exposed.

a vacummized transfer roll with anvils mounted thereon,

a co-acting knife cutoff roll having a plurality of cutoff knives mounted at different locations around the periphery of said cutoff roll to cut segments of said joined adhesive and release tapes, and

a backup roll which supports a continuous web between the transfer roll and the backup roll while the exposed adhesive portion of said segments is adhered to the web.

4,701,240

DEVICE FOR JOINING BY CALENDERING AT LEAST ONE SHEET OF GLASS AND AT LEAST ONE FILM OF PLASTIC MATERIAL

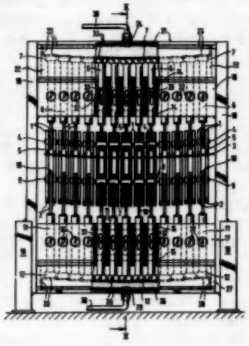
Johannes Kraemer, Bietigheim-Biss, Fed. Rep. of Germany; Klemens Leclere, Neu Moresnet, Belgium; Werner Nuding, Bietigheim-Biss, and Heinz-Josef Schilde, Wuerselen, both of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Cedex, France

Filed Jan. 16, 1986, Ser. No. 819,256

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 3501631

Int. Cl.⁴ B30B *3/04*; B32B *31/20*

U.S. Cl. 156—555 **2 Claims**



1. A calendering device comprising:

a frame;

a plurality of pressure rollers mounted side-by-side in first direction;

a plurality of counterpressure rollers mounted side-by-side in said first direction, each of said counterpressure rollers being positioned for cooperation with one of said pressure rollres to form a plurality of pairs of cooperating pressure and counterpressure rollers;

piston rod means for separately supporting each of said pressure rollers and counterpressure rollers;

means for moving eah said piston rod means in a second direction so that said rollers of each said pair of rollers move toward one another to calender a product therebetween, said means for moving comprising:

(a) first and second fixed fluid tight casings fixed to said frame,

(b) an elastic diaphragm for each said fixed casing tightly dividing each said fixed casing into two portions,

(c) means for supplying pressurized fluid to one of said two portions of each said fixed casing,

(d) a plurality of pistons in the other of said two portions of each said fixed casing, all of said pistons in said first fixed casing being fixed to said piston rod means of said pressure rollers and engaging said diaphragmin said first fixed casing such that movement of said diaphragm due to fluid pressure in said one of said two portions of said first fixed casing presses all of said pistons in said first fixed cassing to move a corresponding pressure roller in said second direction, wherein all of said pistons in said second fixed casing are fixed to said piston rod means of said counterpressure rollers and engage said diaphragm in said second fixed casing such that movement of said diaphragm due to fluid pressure in said one of said portions of said second fixed casing presses all of said pistons in said second fixed casing to move a corresponding counterpressure roller in said second direction,

wherein said piston are spaced from any walls of said fixed casing; and

means for equalizing the pressure between said diaphragms.

4,701,241

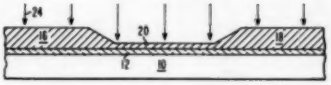
METHOD OF MAKING A RESISTOR

Kenneth M. Schlesier, Delaware Township, Hunterdon County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 6, 1986, Ser. No. 915,649

Int. Cl.⁴ H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/00*

U.S. Cl. 156—643 **15 Claims**



1. A method of forming a resistor on a substrate comprising:

forming a conducting layer with a first thickness on said substrate;

removing said layer from a selected area of said substrate; and

forming a resistor portion in said area with a second thickness less than said first thickness.

4,701,242

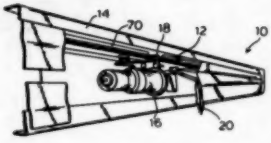
MECHANISM FOR MOVING A SHOWER NOZZLE IN A PAPER MAKING MACHINE

Robert V. Scarano, and James D. Hudon, both of Glens Falls, N.Y., assignors to Albany International Corp., Menands, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,810

Int. Cl.⁴ D21F *1/32*; B08B *3/02*

U.S. Cl. 162—275 **20 Claims**



1. A mechanism for cleaning a moving material comprising:

a housing extending substantially across a width of said moving material;

a track disposed within and supported by said housing, said track being slideable with respect to said housing so as to allow the track to be slideably withdrawn or inserted into the housing;

a trolley movably supported by said track;

watering means secured to said trolley for injecting water toward said material; and

a motor secured to said trolley for moving said trolley with respect to said track.

20. A mechanism for cleaning a moving material comprising:

a housing extending substantially across a width of said moving material;

a track disposed within and secured to said housing;

a trolley movably supported by said track, said trolley comprising a first plate, a plurality of wheels for engaging said track, and a second plate secured to said first plate by shock absorbers;

watering means secured to said trolley for injecting water towards said material;

a stationary rack;

a motor secured to said second plate for moving said trolley with respect to said track, said motor having a shaft and pinion secured to said shaft for engagement with said rack; and

motion sensing means for sensing the motion of said trolley said motion sensing means comprising a second pinion mounted on said trolley, and engaging said rack and means coupled to said second pinion for generating signals corresonding to the rotation of said second pinion.

4,701,243

METHOD FOR COOLING AND DEDUSTING DRY COOLED COKE

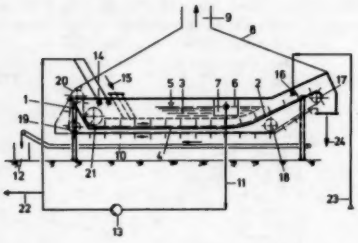
Kurt Lorenz, Hattingen; Horst Dungs, Herne, and Karl-Hans Auge, Dortmund, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. KG, Fed. Rep. of Germany

Filed Feb. 21, 1986, Ser. No. 832,527

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1985, 3505955; Jul. 4, 1985, 3523897

Int. Cl.[4] C10B *39/12*

U.S. Cl. 201—3 **8 Claims**



1. Method of cooling and dedusting dry cooled coke having fine dust adhering thereto, comprising

directing dry cooled coke having fine dust adhering thereto at a temperature of approximately 150° to 200° C. into an immersion tank containing water having a liquid temperature of approximately 100° C., and

conveying the coke through the water and out of the tank at a selectively controlled variable speed for providing an immersion time of the coke in the water of less than three minutes, wherein said immersion time is sufficient for separating said fine dust adhering to the coke, for maintaining the liquid temperature of said water in the tank at approximately 100° C., and for achieving a residual water content of below 5% in the coke after an adequate water evaporation time for attaining adjustment equilibrium of the residual water content upon conveying the thus dedusted coke out of the tank.

4,701,244

BATH AND PROCESS FOR ELECTROPLATING TIN, LEAD AND TIN/ALLOYS

Fred I. Nobel, Sands Point, and Barnet D. Ostrow, Roslyn, both of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Continuation-in-part of Ser. No. 564,516, Dec. 22, 1983, Pat. No. 4,599,149, which is a continuation-in-part of Ser. No. 301,390, Sep. 11, 1981, abandoned. This application May 28, 1985, Ser. No. 738,615

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.[4] C25D *3/32, 3/36, 3/56, 3/60*

U.S. Cl. 204—44.4 **36 Claims**

1. A tin, lead, or tin-lead alloy electroplating bath, which comprises:

(a) a bath containing an alkanesulfonic acid, and either a divalent tin salt or a divalent lead salt thereof or both;

(b) a surfactant selected from the group consisting of:

(1) a cationic surfactant selected from the group consisting of quaternary ammonium salts and alkyl imidazolinium salts,

(2) an amphoteric surfactant selected from the group consisting of betaines, and

(3) a nonionic surfactant selected from the group consisting of at least one ethylene oxide wetting agent; and

(c) an additive selected from the group consisting of benzal acetone, benzaldehyde and at least one benzaldehyde derivative.

4,701,245

OXIDATION OF ORGANIC COMPOUNDS USING A CATALYZED CERIUM (IV) COMPOSITION

Robert P. Kreh, Jessup, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 859,548, May 5, 1986, Pat. No. 4,639,298, and Ser. No. 917,462, Oct. 10, 1986. This application Dec. 17, 1986, Ser. No. 942,758

Int. Cl.[4] C07C *50/12*

U.S. Cl. 204—78 **31 Claims**

1. A process for forming quinonoid group containing compounds from their respective organic substrate selected from aromatic and alkylaromatic compounds comprising contacting the organic substrate with an aqueous acidic solution containing ceric ions in the presence of a catalytically effective amount of chromium cations, said solution having at least about 0.1 molar cerium concentration therein.

4,701,246

METHOD FOR PRODUCTION OF DECONTAMINATING LIQUID

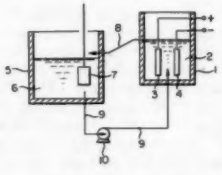
Reiko Fujita, Kamakura, and Masami Enda, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 6, 1986, Ser. No. 836,985

Claims priority, application Japan, Mar. 7, 1985, 60-45647; Mar. 7, 1985, 60-45648

Int. Cl.[4] C25F *5/00*

U.S. Cl. 204—130 **15 Claims**



1. In a process for the removal of radiation-contaminated material from the surface of a metal using a decontaminating

liquid, a method for the production of said decontaminating liquid comprising the steps of:

immersing an anode made of a metal or a metal oxide having a high oxygen overvoltage equal to or higher than the oxygen overvoltage of platinum and a cathode made of a metal or a metal oxide having a low hydrogen overvoltage equal to or lower than the hydrogen overvoltage of platinum in an oxidative solution obtained by dissolving in an acidic solution a metal compound in a low-oxidation state of a metal assuming a high-oxidation state in an aqueous solution, wherein said metal compound in a low-oxidation state is a compound of Ce^{3+}, Cr^{3+}, or VO^{2+} which, on being dissolved in an acidic solution, gives rise in the resultant solution to a metal ion in a low-oxidation state, and

causing passage of an electric current between said two electrodes thereby effecting oxidation of a metal ion in a low-oxidation state and consequent formation of a metal ion in a high-oxidation state at said anode, wherein said metal ion in a high-oxidation state is one member selected from the group consisting of Ce^{4+}, $Cr_2O_7^{2-}$, and VO_2^{+}.

4,701,247

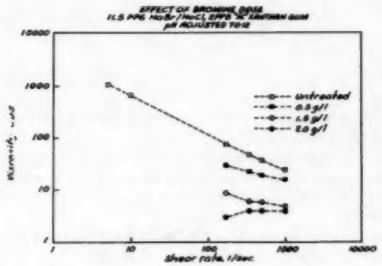
ELECTROCHEMICAL METHODS FOR BREAKING HIGH VISCOSITY FLUIDS

John M. Kalnins; James A. McIntyre; John R. Moyer; Robert F. Phillips, and Karel A. J. Snoble, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 30, 1986, Ser. No. 892,152

Int. Cl.[4] C25B *15/08, 1/24*

U.S. Cl. 204—131 **45 Claims**



1. In a method for reducing the viscosity of viscosified brines used in drilling, completion workover, fracturing and other oil and gas stimulation applications, the improvement comprising contacting an organic polymer viscosified halide ion-containing, aqueous solution with a sufficient amount of an in situ, electrochemically generated breaker suitable to reduce the viscosity of the solution.

4,701,248

APPARATUS FOR ELECTROLYTIC SURFACE TREATMENT OF BULK GOODS

Siegfried Birkle, Hoechstadt, and Johann Gehring, Spardorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

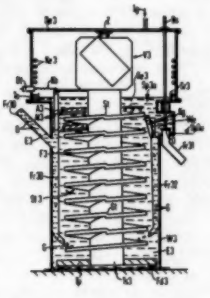
Filed Jun. 30, 1986, Ser. No. 880,080

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1985, 3524510; May 15, 1986, 3616436

Int. Cl.[4] C25D *17/16*

U.S. Cl. 204—201 **20 Claims**

1. In an apparatus for electrolytic surface treatment of bulk goods, said apparatus comprising a tank for the acceptance of a treatment bath, at least one vibratory conveyor being positioned in the tank and having a helically ascending conveyor track for the transport of goods through the treatment bath from a starting region of the conveyor to a discharge end of the conveyor, said tank having feed means for introducing goods from outside the tank onto the starting region and discharge means for receiving goods from the discharge end and removing them from the tank, means for electrically contacting the goods to a polarity of one pole of a voltage source, and at least one electrode arranged in the treatment bath and having a polarity opposite to the polarity of the one pole, the improvement comprising return means for selectively returning the bulk goods from a discharge end of the vibratory conveyor to a starting region of said conveyor, and switch means for selectively connecting the discharge end to one of the return means and discharge means so that the goods can be passed through the treatment bath more than one time before being discharged from the tank.



4,701,249

MOBILE APPARATUS FOR CLEANING REMNANTS OF CARBON ANODE BLOCKS

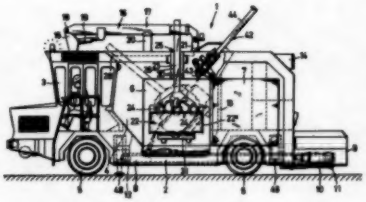
Paul Wisniewski, and Franz Golla, both of Lünen, Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia GmbH, Lünen, Fed. Rep. of Germany

Filed Aug. 12, 1986, Ser. No. 895,634

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531161; May 27, 1986, 3617820

Int. Cl.[4] C25C *3/14*

U.S. Cl. 204—279 **28 Claims**



1. Mobile apparatus for cleaning bar-mounted remnants of carbon anode blocks, the apparatus comprising a cleaning cabin accommodating a separator for separating melt incrustations adhering to the remnants, the cleaning cabin having a closable opening through which a remnant to be cleaned is introducable, and through which a cleaned remnant can be withdrawn, wherein the cleaning cabin forms part of a workshop floor vehicle provided with a propulsion system.

4,701,250

DIMENSIONALLY STABLE ASBESTOS DIAPHRAGM COATED FORAMINOUS CATHODE

Robert W. Fenn, III, Painesville; Emory J. Pless, Cleveland Heights; Richard L. Harris, Painesville, and Kevin O'Leary, Cleveland Heights, all of Ohio, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Continuation of Ser. No. 969,587, Dec. 14, 1978, Pat. No. 4,489,025, which is a continuation of Ser. No. 324,508, Jan. 17, 1973, Pat. No. 4,410,411. This application Dec. 17, 1984, Ser. No. 682,225

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.[4] C25B *11/03, 13/06, 13/08*

U.S. Cl. 204—283 23 Claims

1. A diaphragm-coated cathode product providing a hydraulically permeable dimensionally stable diaphragm on a foraminous chlor-alkali-electrolytic cell cathode and prepared by the method comprising:

(a) forming a slurry of fibrous asbestos and a fibrous thermoplastic fluorine-containing polymer mechanically and chemically resistant to the cell environment by mixing together said asbestos and polymer, said polymer being present in an amount sufficient to prevent substantial swelling of the diaphragm and being selected from the group consisting of:

(1) hydrocarbon resins;

(2) halocarbon homopolymers containing chlorine, fluorine or their mixtures;

(3) copolymers having hydrocarbon and halocarbon moieties wherein the halocarbon moieties contain fluorine, chlorine or their mixtures;

(b) inserting the cathode to be coated into said slurry and depositing a uniform mixture of asbestos and polymer fibers thereon by means of a vacuum;

(c) removing the coated cathode from the slurry;

(d) subjecting same to a temperature sufficient to allow the polymer to soften and flow, without the application of pressure, to a fused polymer lattice binding asbestos fibers together with a discontinuous polymer coating on the asbestos fiber surface; and

(e) cooling the diaphragm coated cathode to substantially room temperature whereby there is obtained a diaphragm, dimensionally stable under operating cell conditions.

4,701,251

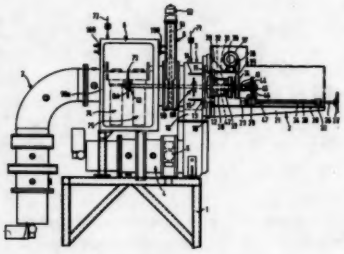
APPARATUS FOR SPUTTER COATING DISCS

Terence Beardow, Endenfield, England, assignor to BVT Limited, Manchester, England

Filed Feb. 3, 1986, Ser. No. 825,210

Int. Cl.[4] C23C *14/34*

U.S. Cl. 204—298 10 Claims



1. Apparatus for sputter coating a substrate in the form of a disc, comprising an evacuable chamber having a disc entry and an exit opening, support means for supporting said disc at the center thereof, drive means for driving said support means to move said disc along a disc path between a disc loading position outside said chamber and a disc coating position within said chamber, a pair of cathodes each having coating material to be sputtered applied to a surface thereof, pivot means mounting said cathodes within said chamber for pivotal movement between withdrawn positions lying clear of said disc path and operating positions wherein said cathodes lie one to each side of said disc when in said coating position, and rotary means for rotating said disc about the center thereof when in said coating position, whereby coating material is sputtered simultaneously onto both sides of said disc as said disc is rotated in said coating position with said cathodes in said operating positions.

4,701,252

DISSOLVED GAS AND ION MEASURING ELECTRODE SYSTEM

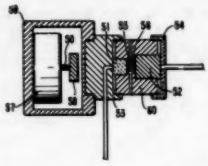
Masahiro Oita, Kashiwara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 504,290, Jun. 14, 1983, abandoned. This application Sep. 10, 1986, Ser. No. 906,633

Claims priority, application Japan, Jun. 16, 1982, 57-104429; Mar. 3, 1983, 58-35394

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—402 4 Claims



1. An electrode system for measuring dissolved gas and ions in a solution, comprising:

a pair of electrodes consisting of a measuring electrode and a reference electrode and each having a flat sensing surface, said sensing surfaces being in spaced opposed relation;

a test chamber having opposite walls constituted by the flat sensing surfaces of said pair of electrodes;

a magnetic stirrer and rubbing body consisting of a block of magnetic material having flat surfaces on opposite sides thereof and positioned in said test chamber between said electrodes with said flat surfaces in sliding contact with the flat surfaces of said electrodes so as to rub simultaneously said sensing surfaces of said electrodes; and

means positioned outside said test chamber and directly magnetically coupled with said magnetic stirrer and rubbing body for rotating said magnetic stirrer and rubbing body so that said sensing surface is rubbed by said magnetic stirrer and rubbing body.

4,701,253

ISFET-BASED MEASURING DEVICE AND METHOD FOR CORRECTING DRIFT

Hendrikus C. G. Ligtenberg, Nietap, and Jozef G. M. Leuveld, Leek, both of Netherlands, assignors to Sentron v.o.f., Netherlands

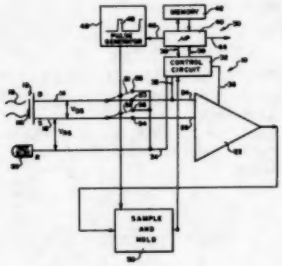
Filed Oct. 29, 1984, Ser. No. 665,808

Int. Cl.[4] G01N *27/46*

U.S. Cl. 204—416 14 Claims

10. A method for correcting drift effects of an ISFET in a measuring device comprising an ISFET used as a chemically selective ion sensor, a reference electrode, an amplifier and control circuit means including a clock signal generator for timing, with clock signals, time periods of operation of the device and for maintaining two of three operating parameters

of said ISFET constant while adjusting the third parameter, the parameters being V_{DS}, I_{DS} and V_{RS}, said controlling of the three parameters including: V_{DS} constant, I_{DS} constant, V_{RS} adjusted; and V_{RS} constant, I_{DS} constant, V_{DS} adjusted; said method including the steps of: effecting drift correction due to drift effects of said ISFET including adjusting the voltage supplied to the reference electrode relative to changes in potential drift, V_p, on the basis of the logarithmic equation:



$$\Delta Vp = A \ln (t/t_o + 1)$$

where:

ΔV_p = potential drift

A = scale factor for drift and amplitude

t_o = time constant defining the dependence on time

t = time during which the sensor is operative in the event of continuous operation.

4,701,254

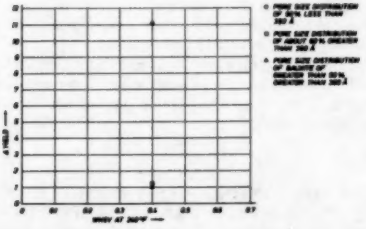
STATIC BED WAX DECOLORIZATION PROCESS

Lawrence W. Maas, Pasadena; Richard A. Geiman, and Charles T. Adams, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 758,181, Jul. 23, 1985, abandoned. This application Oct. 24, 1986, Ser. No. 922,905

Int. Cl.[4] C10G *73/42*

U.S. Cl. 208—26 **15 Claims**



1. A process for removing color-impurities from petroleum-derived wax which comprises contacting said petroleum-derived wax with an adsorbent comprising a refined low-impurity aluminum oxide having pores of a size wherein at least 90% of said pores possess a size of less than 350 A, at contacting conditions, to adsorb said color-impurities on said refined low-impurity aluminum oxide and to produce a petroleum-derived wax having fewer color-impurities than said petroleum-derived wax treated in said process.

4,701,255

REFORMING WITH POLYMETALLIC CATALYSTS

William C. Baird, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 21, 1986, Ser. No. 933,380

Int. Cl.[4] C10G *35/08*

U.S. Cl. 208—139 **19 Claims**

1. In a process for catalytically reforming, with hydrogen, a hydrocarbonn naptha feed at reforming conditions

the improvement comprising

contacting said naphtha feed, and hydrogen, with a halogenated, supported platinum catalyst promoted with iridium agglomerated to exhibit a crystallinity greater than 50 percent, as measured by x-ray.

4,701,256

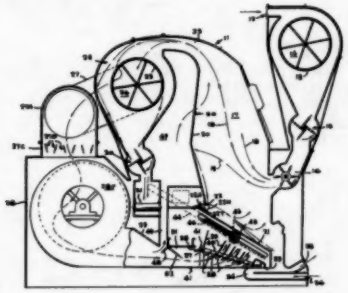
RECIRCULATING PNEUMATIC SEPARATOR

Wiley E. Cross, Jr., Glen Allen, Va., assignor to The Cardwell Machine Company, Richmond, Va.

Filed Dec. 13, 1985, Ser. No. 809,112

Int. Cl.[4] B07B *4/02*

U.S. Cl. 209—139.1 **8 Claims**



1. A pneumatic separator for separating lighter particles from heavier stem particles and the like, as in tobacco threshing, comprising a separating chamber, means for circulating air in a generally upward path through said chamber, inlet rotary impeller means mounted on one side of said separating chamber having vanes for thrusting particles to be separated into and across the chamber toward a generally upwardly extending opposite wall of said chamber, an inclined perforated plate member defining a bottom wall portion of said chamber below the level of said impeller means for directing larger particles discharged toward or falling onto the inclined plate member for collecting and carrying heavier particles from the chamber, an air jet impeller means located immediately above said inclined plate at a lowermost portion of said opposite wall and means for conducing air to said jet impeller means to discharge an air jet therefrom for directing material into a high arc trajectory into said chamber, an air diffusion grating assembly below said inclined perforated plate member receiving air discharged from a fan and having a plurality of adjustable directional vanes and a plurality of fixed direction vanes, a first group of said vanes being positioned and oriented to reduce air flow and velocity in selected portions of the separating chamber lying above said first group and a second group of said vanes being positioned and oriented to increase air flow and velocity in other portions of the separating chamber lying above said second group to selectively direct upward air flow through said chamber for maximum separating efficiency, and said upwardly opening opposite wall having discharge openings located at a vertical position above said level of said impeller means and means for supplying air through said openings to provide air flow therethrough into said chamber in zones located above the height of said openings.

4,701,257
FATTY ESTERS OF ALKANOLAMINE HYDROXYALKYLATES AS OXIDIZED COAL CONDITIONER IN FROTH FLOTATION PROCESS

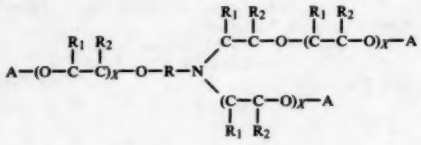
Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 6, 1986, Ser. No. 826,658
Int. Cl.[4] B03D 1/02
U.S. Cl. 209—166 20 Claims

1. An improved froth flotation process for cleaning coal using alkanolamine hydroxyalkylates or fatty esters thereof comprising the steps of:

(a) crushing the coal to a size suitable for classification by froth flotation; and

(b) floating the sized coal in a frothing aqueous medium comprising a fuel oil collector and an effective amount of a conditioner corresponding to the formula:



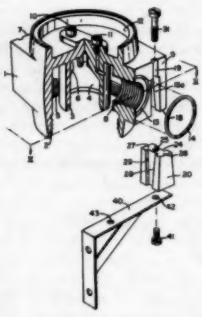
wherein,
R is any hydrocarbyl group;
R_1 is H or an alkyl;
R_2 is H or an alkyl;
X is an integer of 1 or more;
A is H or

and
R_3 is an alkyl of from 2 to 36 carbon atoms.

4,701,258
FILTER HOUSINGS

Colin T. Billiet, Durham, and David Baggett, Newcastle, both of England, assignors to Domnick Hunter Filters Limited, Durham, England

Filed Jun. 12, 1986, Ser. No. 873,622
Claims priority, application United Kingdom, Jun. 13, 1985, 8515046
Int. Cl.[4] B01D 35/00
U.S. Cl. 210—232 5 Claims

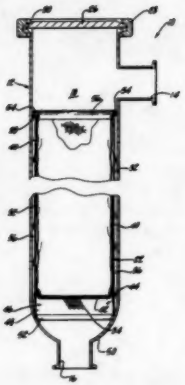


1. A filter housing comprising: mean enabling connection to an adjacent structure which precludes the need for bolts which pass through the housing in interfering relationship with the flow paths within the housing, said housing including a body having at least one substantially planar external face, means in said body for providing at least one flow path, securing means on said body adapted to secure a filter to said body in operative connection with the flow path, said flow path opening from said substantially planar external face of said body, and said body being formed with a pair of passages lying behind said external face, one to each side of said opening, each said passage having an internal wedge face facing away from said external face and lying in a plane that makes an acute angle with the plane of said external face.

4,701,259
FLUID FILTER WITH FILTER RETAINER

Nils N. Rosaen, Brighton, Mich., assignor to Rosedale Products, Inc., Ann Arbor, Mich.

Filed Mar. 27, 1986, Ser. No. 844,533
Int. Cl.[4] B01D 29/14
U.S. Cl. 210—450 19 Claims



1. In combination with a filter housing having a fluid inlet and a fluid outlet and defining an open topped chamber intermediate said inlet and outlet; a fluid pervious open-topped filter basket dimensioned to be received in said chamber through the open top of said chamber; and a filter bag dimensioned to be received in said filter basket through the open top of the basket, the improvement comprising:

means for positioning said basket in said chamber by supporting a bottom of said basket; and

means for supporting a bottom of said bag within said basket and above the bottom of said basket, said means for supporting comprising a perforated support plate secured to the filter basket.

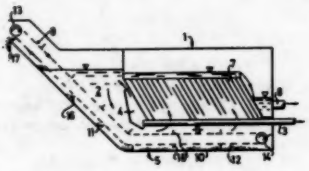
4,701,260
DEVICE FOR CONTINUOUS SEPARATION OF SOLID PARTICLES FROM A LIQUID SUSPENSION

Hyosong M. Lee, Malmvägen 20, S-147 00 Tumba, Sweden

Filed Aug. 25, 1986, Ser. No. 899,963
Claims priority, application Sweden, Sep. 6, 1985, 8504151
Int. Cl.[4] B01D 45/10
U.S. Cl. 210—521 7 Claims

1. Device for continuous separation of solid particles from a liquid suspension, comprising a tank with a separator space, into which an inlet leads for the liquid suspension containing solid particles, said space having firstly a primary separation zone where the larger solid particles can precipitate to a bottom portion of the tank, and secondly a secondary separation

zone located downstream of the primary zone and containing a lamella separator unit for further separation of solid particles from the liquid flow on its way towards an outlet, the lamella separator being arranged so that the particles caught therein can also precipitate to the bottom portion of the tank, said device also comprising a means for feeding out the solid particle sludge collected on the bottom portion of the tank, said tank having a substantially horizontal bottom portion, located under the lamella separator unit and the secondary separation zone, and an inclined portion located under the primary sepa-



ration zone, said feed-out means comprising an endless scraper conveyor which has a portion running along the horizontal bottom of the tank and a portion running along the inclined portion, transverse scraper elements on the conveyor being arranged to slowly push the sludge along the bottom and inclined portions up above the liquid surface in the tank and there dewater the sludge before it is fed out through an outlet located higher up, said inlet leading into a distributor drum arranged to direct the incoming liquid suspension up toward the region of the primary separation zone of the tank where the scraper conveyor emerges from the liquid surface in the tank.

4,701,261

PROCESS FOR THE SEPARATION OF METALS FROM AQUEOUS MEDIA

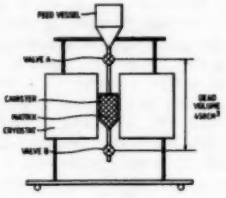
Dudley F. Gibbs, Healey, nr. Riding Mill; Marilyn E. Greenhalgh, Whickham; James H. P. Watson, St. Austell, all of England; Richard G. Yeo, Colinton, Scotland, and Derek C. Ellwood, Winterbourne Stoke, nr. Salisbury, England, assignors to Bio Separation Limited, Hertfordshire, England

Filed Dec. 19, 1985, Ser. No. 810,593

Claims priority, application United Kingdom, Dec. 19, 1984, 8431990

Int. Cl.⁴ C02F *3/00*; C12N *13/00*

U.S. Cl. 210—606 **7 Claims**



1. A process for the separation of a paramagnetic metal from an aqueous medium containing said paramagnetic metal in the form of ions which comprises contacting said medium with cellular particles having enzymatic activity in the presence of a compound which is enzymatically converted by said particles into an ion which forms a water-insoluble salt with the paramagnetic ions, said salt becoming bound by said particles, and then separating the particles having the paramagnetic metal salt bound thereto magnetically from said aqueous medium.

4,701,262

WATER TREATMENT POLYMERS AND METHODS OF USE THEREOF

Fu Chen, Newtown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

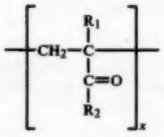
Continuation of Ser. No. 864,049, May 16, 1986, Pat. No. 4,659,481, which is a continuation of Ser. No. 545,563, Oct. 26, 1983, abandoned. This application Oct. 21, 1986, Ser. No. 921,670

The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

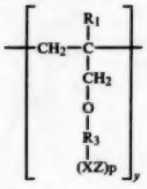
Int. Cl.⁴ C02F *5/14*

U.S. Cl. 210—699 **3 Claims**

1. Method of inhibiting the formation and deposition of calcium containing scale imparting compounds including calcium carbonate and calcium sulfate in an aqueous medium comprising adding to said aqueous medium from about 0.1–500 parts per million parts of said aqueous medium of (I) a water soluble polymer comprising repeat unit moieties (a) and (b) wherein said repeat unit (a) comprises the structure



and wherein said repeat unit (b) comprises the structure



wherein each R_1 is independently H or lower akyl (C_1–C_3), R_2 is OH, or OM, M is a water soluble cation, R_3 is a hydroxy substituted alkylene radical having from about 1 to 6 carbon atoms, X is SO_3, Z is H or a water soluble cation or cations, p is 1, the molar ratio x:y of said polymer being between about 10:1 to 1:5, wherein the number average molecular weight of said water soluble polymer is between about 1,500 to 500,000, and also adding to said aqueous medium from about 1–500 parts per million of (II) 2-phosphonobutane 1,2,4-tricarboxylic acid.

4,701,263

USE OF AMINE NEUTRALIZED SULFONATED POLYSTYRENES FOR PARTICLE FLOCCULATION

Donald J. Mintz, Summit; Dennis G. Peiffer, East Brunswick; Warren A. Thaler, Flemington, and Ilan Duvdevani, Leonia, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 23, 1985, Ser. No. 812,518

Int. Cl.⁴ B01D *21/00*

U.S. Cl. 210—728 **2 Claims**

1. A process for flocculating solid fines selected from the group consisting of coke films, catalyst fines, synthetic fuel fines, coal fines, and shale fines from a solution comprising said solid fines and an organic liquid which comprises the steps of:

(a) adding with mixing about 5 to about 10,000 ppm of a water insoluble unneutralized or neutralized sulfonated polystyrene to said solution wherein said sulfonated polystyrene is dissolved in a dissolving organic liquid at a

concentration level of about 0.01 to about 20 weight percent, and has about 0.5 to about 100 mole percent of sulfonate groups; and

(b) heating at about 25° C. to about 350° C. for about 1 to about 45 minutes the mixture of said solution and said unneutralized or neutralized polystyrene wherein said sulfonated polystyrene is absorbed on the surface of said solid fines, and said solid fines collide to form agglomerates which precipitate out of said solution.

4,701,264

PROCESS FOR FLOCCULATING TACONITE TAILINGS

David B. Braun, Ridgefield, Conn., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 508,412, Jun. 28, 1983, abandoned, which is a continuation of Ser. No. 320,493, Nov. 12, 1981, abandoned. This application May 6, 1985, Ser. No. 730,957

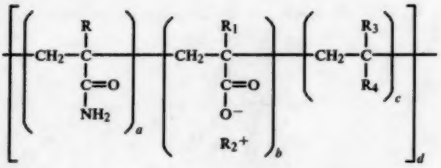
The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.

Int. Cl.⁴ C02F *1/56*

U.S. Cl. 210—734 **8 Claims**

1. A process for flocculating taconite tailings which comprises:

(a) forming a concentrated aqueous solution from a water-soluble, ter- or higher polymer of water-soluble monomers and hydrophobic monomer, which polymer has the following formula:

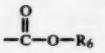


wherein:

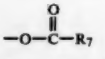
R, R_1 and R_3 are independently hydrogen or methyl;

R_2^+ is an alkali metal ion;

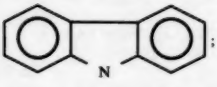
R_4 is OR_5 where R_5 an alkyl group having up to 5 carbon atoms;



where R_6 is an alkyl group having up to 8 carbon atoms;



where R_7 is methyl, ethyl or butyl; phenyl; substituted phenyl; CN; or



;

a is from 5 to about 90 mole percent;

b is from 5 to about 90 mole percent;

c is from about 0.2 to about 20 mole percent;

d is an integer of from about 1,000 to about 500,000;

as a water-in-oil emulsion;

(b) diluting said concentrated aqueous solution of ter- or higher polymer formed in step (a) with additional water;

(c) mixing the diluted solution of step (b) with taconite tailings under appropriate floc forming conditions; and

(d) allowing the suspended solids to settle to form an essentially clear aqueous supernatant.

4,701,265

CHLORINATING APPARATUS

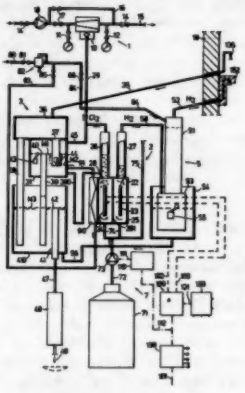
H. Roger Carlsson, Täby; Stephan Schwartz, Vaxholm, and Mats Hallberg, Sollentuna, all of Sweden, assignors to Electrocell AB, Åkersberga, Sweden

Filed May 29, 1986, Ser. No. 867,444

Claims priority, application Sweden, May 29, 1985, 8502652

Int. Cl.⁴ E04H *3/20*; C25B *9/00*

U.S. Cl. 210—744 **20 Claims**



1. Apparatus for chlorinating a liquid such as water comprising an electrochemical cell with an anolyte chamber having an upper space and a catholyte chamber which are separated by an ion-selective diaphragm, a metering device including a conduit for supplying consumption hydrochloric acid to the cell, a hydrogen outlet means, a chlorine gas outlet from the upper space of the anolyte chamber, a chlorine gas pipe for transferring chlorine gas from the chlorine gas outlet to a pipe for the liquid which is to be chlorinated, a feed device connecting the chlorine gas pipe to the liquid pipe the feed device being disposed for generating a pressure in the chlorine gas pipe which is lower than atmospheric pressure and also a gas flow in the chlorine gas pipe which is greater than the greatest gas production flow of the cell, an atmospheric air pipe communicating with the chlorine gas pipe, via a liquid trap device which comprises a closed first vessel having a liquid chamber and means for establishing high and low pressure sides therein, a liquid overflow outlet on the low pressure side of the liquid trap device, means for feeding a liquid through the liquid chamber of the liquid trap device to, and through the overflow outlet, and sensing means for sensing the liquid level in the liquid trap device, said sensing means being adapted to inhibit chlorine production of the cell if the sensed liquid level deviates from a pre-determined level.

4,701,266

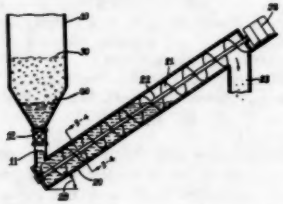
SOLIDS DEWATERING APPARATUS AND PROCESS

John C. Janka, Forest Park; Frank C. Schora, Palatine, and Ted M. Knowlton, Hinsdale, all of Ill., assignors to Hycrude Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 600,306, Apr. 13, 1984, abandoned. This application Apr. 21, 1986, Ser. No. 854,168

Int. Cl.[4] B01D *21/00, 23/00*

U.S. Cl. 210—803 19 Claims



1. In an apparatus for continuous liquid removal from a mixture with solid particulate materials, said apparatus comprising: an inclined, rotatable, screw conveyor means within a pressurized, generally cylindrical housing means, said screw conveyor means having solid helical flights capable of providing an axial speed of said solid particulate materials of less than 20 feet per minute and when in rotating motion having an upcoming side and an opposite downcoming side, said upcoming side in proximity to and in unobstructed communication with said housing means and sufficiently close thereto to provide said axial speed of solid particulate materials having average diameters of about ¼ to about 2 inches and said downcoming side spaced from at least a portion of said housing means to form a liquid collection volume extending laterally outwardly below the quiescent level of said liquid in unobstructed communication with said screw conveyor means, and liquid removal means in communication with said liquid collection volume for liquid removal, said housing means inclined at an angle of about 20° to about 45° to the horizontal.

10. A process for liquid removal from a mixture with solid particulate materials, said process comprising: feeding said mixture of liquid and solid particulate materials, said solid particulate materials having diameters about ¼ to about 2 inches and present in less than 20 volume percent of said mixture, to the lower portion of an inclined screw conveyor means having solid helical flights within a pressurized, generally cylindrical housing means, said solids occupying less than about 20 percent of the cross-sectional area of said screw conveyor means; rotating said screw conveyor means creating an upcoming side and an opposite downcoming side, at an angular velocity causing axial movement of said solid particulate materials at less than about 20 feet per minute and causing aggregating of said solid materials toward said upcoming side of said screw conveyor means in unobstructed communication with said housing means and sufficiently close thereto to provide said axial speed of said solid particulate materials of about ¼ to about 2 inches and collecting of said liquid toward said downcoming side and by unobstructed communication forming a liquid collection volume in an outwardly laterally extending portion of said housing means spaced from said screw conveyor means below the quiescent level of said liquid, maintaining said housing means at an angle of about 20 degrees to about 45 degrees to the horizontal causing downward movement of said liquid in said liquid collection volume; continuing upward movement of said solid particulate materials for a vertical height of at least two times the diameter of said screw means above the quiescent liquid level; removing liquid from said liquid collection means; and removing said solid particulate materials, substantially free of said liquid, from the upper portion of said screw conveyor means.

4,701,267

METHOD FOR REMOVING LEUKOCYTES

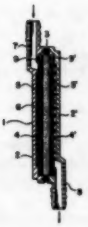
Hiroyuki Watanabe, and Hiroshi Rikumaru, both of Oita, Japan, assignors to Asahi Medical Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1985, Ser. No. 711,667

Claims priority, application Japan, Mar. 15, 1984, 59-48173; Mar. 27, 1984, 59-57450

Int. Cl.[4] B01D *27/02, 36/02, 39/02*

U.S. Cl. 210—806 2 Claims



1. A method for removing leukocytes from a leukocyte-containing suspension, comprising the steps of: passing a leukocyte-containing suspension through a filter unit which comprises:

a container having at least one inlet conduit means and at least one outlet conduit means; and

a main filter packed therein in the form of a non-woven fabrics, said fabrics comprising fibers wherein the average daimeter of all of the fibers in said fabrics is from 0.3 μm to less than 3 μm and said fabric having a bulk density of from 0.01 g/cm^3 to 0.7 g/cm^3, and wherein the average distance between any two of all adjacent fibers throughout said fabric is 0.5 μm to 7.0 μm and is defined by the following equation (I):

$$y = x\left(\sqrt{\frac{\pi}{2\sqrt{3}}}\cdot\sqrt{\frac{\rho}{D}} - 1\right) \quad (I)$$

wherein y is the average distance between two adjacent fibers in microns; x is the average diameter of fibers in microns; ρ is the density of the fibers in g/cm^3; D is the bulk density of the filter in g/cm^3; and π is a circular constant; and

obtaining a leukocyte-poor liquid.

4,701,268

FABRIC CONDITIONERS

Charles R. Nelson, Nr Carlisle, and Hugh Thomas, Great Ayton, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 10, 1985, Ser. No. 743,353

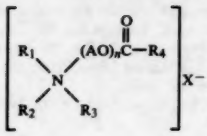
Claims priority, application United Kingdom, Jun. 12, 1984, 8414944

Int. Cl.[4] D06M *13/46*

U.S. Cl. 252—8.8 7 Claims

1. A fabric softening composition wherein the active system consists essentially of a blend of at least 10% by weight of at least two components A and B wherein:

(A) Component A comprises an organic amine derivative having general formula



where

R_1 comprises a long chain alkyl group containing 8 to 24 carbon atoms;

R_2 and R_3, which may be the same or different, comprise hydrogen or an alkyl group containing 1 to 10 carbon atoms;

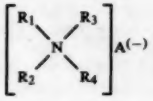
R_4 comprises a long chain alkyl group containing 8 to 24 carbon atoms;

AO comprises an alkylene oxide or mixed alkylene oxide, and n is in the range 1 to 10; and

X is an anion;

and

(B) Component B comprises a quaternary ammonium compound of general formula:



where

R_1 and R_2 which may be the same or different are long chain alkyl groups containing 8 to 24 carbon atoms;

R_3 and R_4 which may be the same or different are short chain alkyl groups containing 1 to 6 carbon atoms; and

A is an anion;

and wherein the weight ratio of component A to component B (ignoring any other constituents of the fabric softening composition) is in the range 90:10 to 40:60.

4,701,269

WATERPROOFING LEATHER AND SKINS

Herbert Bay, Reutlingen; Rudi Widder, Leimen, and Guenter Eckert, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 13, 1986, Ser. No. 895,686

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1985, 3529869

Int. Cl.[4] C14C *9/00*

U.S. Cl. 252—8.57 **7 Claims**

1. A process for waterproofing leather and skins with a silicone oil in the presence of a salt of an N-(C_9-C_{20}-acyl)-amino acid as an emulsifier, wherein

(a) an aqueous emulsion of a silicone oil, consisting of from 15 to 90% by weight of silicone oil, from 5 to 30% by weight of an alkali metal, ammonium or alkanolamine salt of an amino acid of 2 to 6 carbon atoms which has an acyl radical of a saturated or unsaturated fatty acid of 9 to 20 carbon atoms on the amine nitrogen atom, which may additionally be substituted by methyl, and from not less than 5% by weight to the remainder to 100% by weight, of water, the emulsion being brought to pH 5–12, with an alkali metal hydroxide, ammonia or an alkanolamine, or

(b) an anhydrous mixture of from 70 to 90% by weight of a silicone oil and from 10 to 30% by weight of an alkanolamine salt of an amino acid of 2 to 6 carbon atoms which has an acyl radical of a saturated or unsaturated fatty acid of 9 to 20 carbon atoms on the amine nitrogen atom, which may additionally be substituted by methyl,

in an amount of from 0.5 to 20% by weight, based on the shaved weight of the leather or wet weight of the skins, is allowed to act on the leather or skins being treated, in an aqueous liquor at pH 4.5–8.0, during or after retanning, after which the pH is brought to 3.0–5.0 and, if required, the leather or skins are after-treated in the aqueous solution with a divalent, trivalent or tetravalent metal salt conventionally used in tanning.

4,701,270

NOVEL COMPOSITIONS SUITABLE FOR TREATING DEEP WELLS

Ronald S. Bullen; Joseph Mzik, both of Calgary, and Jean P. Richard, Markham, all of Canada, assignors to Canadian Fracmaster Limited, Calgary, Canada

Filed Feb. 18, 1986, Ser. No. 829,924

Claims priority, application Canada, Feb. 28, 1985, 475363

Int. Cl.[4] E21B *43/26*

U.S. Cl. 252—8.551 **7 Claims**

1. An anhydrous deep well fracturing composition which comprises liquid carbon dioxide thickened with from 1.5% to 3.5% by weight of the total composition of the reaction product of an alkene oxide of 2–4 carbon atoms and liquid carbon dioxide the said reaction product being a viscosity-increasing liquid copolymer having a molecular weight of from 20,000 to 150,000.

4,701,271

TREATING OIL-WATER-SURFACTANT EMULSIONS WITH STRONG INORGANIC ACID

Sophany Thach; Stephen J. Salter, both of Dallas; Kevin O. Meyers, and Ronald M. Giordano, both of Plano, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 7, 1982, Ser. No. 415,089

Int. Cl.[4] C09K *7/00;* **B01J** *13/00*

U.S. Cl. 252—8.554 **3 Claims**

1. In the recovery of oil from a subterranean formation by injecting into said formation a liquid containing a sulfonated surfactant, a method for breaking an emulsion comprising adding a strong inorganic acid to an emulsion comprised of crude oil, water and sulfonated surfactant produced from said formation, the amount of said acid added to said emulsion being in an amount sufficient to cause the pH of the water in said emulsion to be 3.0 or lower than 3.0.

4,701,272

SILICONE GREASE COMPOSITION

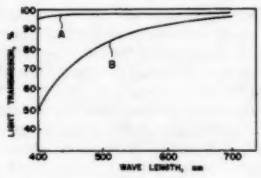
Shigeru Mori, and Takayuki Takahashi, both of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1986, Ser. No. 849,477

Claims priority, application Japan, Apr. 24, 1985, 60-87788

Int. Cl.[4] C10M *113/12*

U.S. Cl. 252—28 **6 Claims**



1. A light-transmitting silicone grease composition which comprises:

(a) 100 parts by weight of a methyl phenyl polysiloxane having a viscosity in the range from 100 to 500,000 centistokes at 25° C. and containing from 5 to 20 % by moles of phenyl groups based on the overall amount of the organic groups bonded to the silicon atoms;

(b) from 1 to 30 parts by weight of a fumed silica filler having a specific surface area of at least 130 m^2/g; and

(c) from 0.1 to 20 parts by weight of an alkoxy-containing organosilane compound represented by the general formula

$$X_aSiMe_bR_c$$

in which Me is a methyl group, R is an alkoxy group, X is a monovalent group selected from the class consisting of a vinyl group, 3-methacryloxypropyl group and 3-glycidyloxypropyl group, the subscript a is zero or 1, b is zero, 1 or 2 and c is 2 or 3 with the proviso that a+b+c is equal to 4.

4,701,273

LUBRICANT COMPOSITIONS CONTAINING ANTIOXIDANTS, AMINE PHOSPHATES AND 4- (5-) METHYL-1-[DI-(2-ETHYLHEXYL) AMINOMETHYL]-BENZOTRIAZOLE

Arthur Brady, Magden; Ulrich Kristen, Rheinfelden; Hermann F. Angerer, Biel-Benken, and Franz Regenass, Liestal, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 682,630, Dec. 17, 1984, abandoned. This application Sep. 10, 1986, Ser. No. 906,627

Claims priority, application Switzerland, Dec. 23, 1983, 6882/83

Int. Cl.[4] C10M *137/08*

U.S. Cl. 252—32.5 7 Claims

1. A stabilizer system which contains

(a) 1-[di-(2-ethylhexyl)-aminomethyl[-benztriazole which is substituted by methyl in the 4-position and/or 5-position in the benzene ring, and

(b) at least one antioxidant selected from the group consisting of pentaerythrityl tetrakis-[3-(3,5-di-tert.-butyl-4-hydroxyphenyl)-propionate], isooctyl 3,5-di-tert.-butyl-4-hydroxybenzylmercaptoacetate, o-tert.-butylphenol, 2,6-di-tert.-butyl-4-methylphenol, 4,4'-methylenebis-(2,6-di-tert.-butylphenol), tert.-octylated N-phenyl-1-naphthylamine, and a mixture of monoalkylated and dialkylated tert.-butyldiphenyl-amines/tert.-octyldiphenylamines, where the weight ratio between component (a) and component (b) is 1:2 to 1:10.

4,701,274

TRISUBSTITUTED-BORATE COMPOUNDS

Michael C. Croudace, Huntington Beach; Leah T. Mendelson, Santa Ana, and Richard A. Holstedt, Whittier, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 26, 1985, Ser. No. 727,894

Int. Cl.[4] C10M *139/00, 135/00*

U.S. Cl. 252—46.3 42 Claims

1. A reaction product of sulfur with an intermediate reaction product of a boron compound and one mono-functional phenol compound, and one or more mono-functional, aliphatic compounds, said phenol compound being reacted with said boron compound in a 1:1 molar ratio.

4,701,275

TESTING SYSTEM

Isabelle Y. Duminy-Kovarik, Malta, Ill., assignor to Circle Chemical Company, Inc., Hinckley, Ill.

Filed Sep. 17, 1986, Ser. No. 908,251

Int. Cl.[4] H01L *1/28;* G01N *27/82;* C09K *1/02*

U.S. Cl. 252—62.52 20 Claims

1. An aqueous testing system for determining a flaw in an article, wherein said system includes a water based slurry of magnetic particles, and said system further includes a corrosion inhibitor, a surface tension adjusting agent, an antifoam agent, a viscosity adjusting agent, and a buffering agent to assist in the corrosion resistance.

4,701,276

SUPER PARAMAGNETIC FLUIDS AND METHODS OF MAKING SUPER PARAMAGNETIC FLUIDS

John E. Wyman, Westford, Mass., assignor to Hitachi Metals, LTD., Tokyo, Japan

Filed Oct. 31, 1986, Ser. No. 925,248

Int. Cl.[4] H01F *1/25, 10/10*

U.S. Cl. 252—62.52 53 Claims

1. A magnetic fluid comprising:

(a) a carrier liquid;

(b) a dispersing agent comprising a salt of an aromatic sulfonic acid which disperses coated magnetic particles in said carrier liquid; and

(c) coated magnetic particles coated with at least one organic acid which renders said magnetic particles hydrophobic, said organic acid being capable of peptizing said magnetic particles into a fugitive solvent, said fugitive solvent being a solvent for said dispersing agent.

4,701,277

SILICATE-CONTAINING ANTIFREEZE WITH CARBOXY-SUBSTITUTED ORGANOSILICON STABILIZER

Paul H. Mohr, Chappaqua, and Enrico J. Pepe, Amawalk, both of N.Y., assignors to First Brands Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 781,985, Sep. 30, 1985, abandoned. This application Apr. 24, 1986, Ser. No. 855,380

Int. Cl.[4] C09K *5/00*

U.S. Cl. 252—75 43 Claims

1. An antifreeze having a selected pH comprising:

(a) an alcohol,

(b) a buffer in an amount to maintain said pH for the antifreeze,

(c) a silicate in a corrosion-inhibiting amount, and

(d) an organosilicon carboxylate having the formula:

$$[MOC(C_nH_{2n}O)_a(C_mH_{2m})_bSiZ_{4-(b+c)}$$

wherein a is from 0 to 20, b is 1 or 2, c is 0 or 1, n is an integer of 2 to 4, m is from 3 to 15, M is a monovalent cation, R^1 is selected from the group consisting of hydrogen, monovalent hydrocarbon radicals and substituted monovalent hydrocarbon radicals, and Z is a hydrolyzable moiety attached to silicon, with the proviso that when a is 0, m is from about 7 to about 15, said carboxylate being present in an amount sufficient to stabilize the silicate.

4,701,278

UTILIZATION OF A CYCLOALIPHATIC CARBINOL AS PERFUMING INGREDIENT

Charles Fehr, Versoix, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed Oct. 30, 1985, Ser. No. 792,999

Claims priority, application Switzerland, Nov. 6, 1984, 5308/84

Int. Cl.[4] A61K *7/46;* C11D *3/50*

U.S. Cl. 252—132 4 Claims

1. A method to enhance or modify flowery type perfume notes, reminiscent of those developed by lily-of-the-valley and coriander, of perfumes and consumable materials, which comprises adding thereto a fragrance effective amount of 4-cyclohexyl-2-methyl-2-butanol in admixture with other perfume coingredients.

4. A product made by the process of claim 1 wherein the consumable material is a soap or a solid or liquid detergent.

4,701,279
ANISOTROPICALLY ELECTROCONDUCTIVE ADHESIVES

Toshiyuki Kawaguchi; Hideki Suzuki, and Tsuneo Usuda, all of Saitama, Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1986, Ser. No. 897,369
Claims priority, application Japan, Aug. 16, 1985, 60-180350
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—511 6 Claims

1. An anisotropically electroconductive composition which comprises:

(a) an electrically insulating homogeneous polymeric adhesive composition as the matrix which is a mixture comprising

(a-1) an uncrosslinked thermoplastic elastomer, and

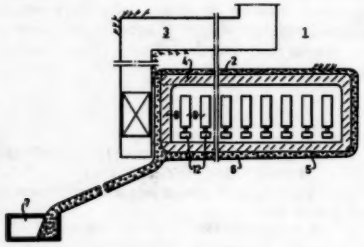
(a-2) a crosslinked thermoplastic elastomer or a crosslinked synthetic rubber selected from the group consisting of butadiene rubbers, isoprene rubbers, chloroprene rubbers, silicone rubbers, and EPDM rubbers, in an amount of at least 25% by weight based on the amount of component (a-1), said thermoplastic elastomer being selected from the group consisting of styrene based elastomer products of the polyaddition reaction between a diol and an aromatic diisocyanate, block-wise copolymers of polyesters, block-wise copolymers of polyethers, butyl-grafter polyethylenes, mixtures or reaction products of an EPDM and polypropylene, and copolymers of dimethylpolysiloxane and styrene; and

(b) electroconductive particles in an electroconductive effective amount uniformly dispersed in the electrically insulating polymeric adhesive composition as the component (a).

4,701,280
PROCEDURE FOR PERMANENTLY STORING RADIOACTIVE MATERIAL

John Canevall, 19, Kungsholmsgatan, S-112 27 Stockholm, Sweden

PCT No. PCT/SE82/00202, § 371 Date Feb. 8, 1984, § 102(e) Date Feb. 8, 1984, PCT Pub. No. WO83/04455, PCT Pub. Date Dec. 22, 1983
PCT Filed Jun. 9, 1982, Ser. No. 578,063
Int. Cl.[4] G21F 9/24
U.S. Cl. 252—633 6 Claims



1. A method of storing radioactive material in a hollow construction having an access opening, the construction being located below the surface of the ground within a rock chamber, said chamber having walls, a floor, and a ceiling; said construction being completely spaced from the walls, floor, and ceiling of the rock chamber to form an outer spacing, and said construction being made of material impervious to water, the construction comprising a capsule storage area and a capsule handling passageway adjacent thereto having a track and being connected to a lift-shaft running to the surface, the method including the steps of:

completely filling the outer spacing between the walls, ceiling, and floor of the rock chamber and the construction with material not impervious to water;

placing capsules containing the radioactive waste in encapsulated form into the capsule storage area;

filling the storage area around the loaded capsule with a sealing material to enclose the capsules;

repeating the placing and filling steps until the storage area has been completely filled in with the capsules and sealing material;

loading the passageway adjacent the storage area with a removable material different than the sealing material;

closing the construction and sealing the lift-shaft at least at the construction level and at ground level; and

providing means for collecting any water penetrating into the outer spacing.

4,701,281
PROCESS FOR THE PREPARATION OF ANTHRAQUINONE IMIDES

Rudolf Blattner, Rheinfelden, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 26, 1986, Ser. No. 844,408
Claims priority, application Switzerland, Apr. 1, 1985, 1400/85
Int. Cl.[4] C07C 97/24
U.S. Cl. 260—367 9 Claims

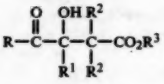
1. In a process for the preparation of an anthraquinone imide by condensing a vattable anthraquinone compound which contains at least one primary amino group with a halogenated anthraquinone, benzanthrone, anthanthrone, pyranthrone, dibenzanthrone, phthaloylacridone, flavanthrone, dibenzpyrenequinone or isoviolanthrone, which aromatic halogen compounds are unsubstituted or further substituted by halogen, alkyl, alkoxy, acylamino or fused benzene rings, in an non-aqueous inert organic solvent and in the presence of a base and a copper catalyst, the improvement of which comprises heating a portion of the inert organic solvent to the reaction temperature which is in the range of 140° to 250° C. and, at this temperature, adding the reactants in the form of a suspension or solution in such a manner that the reaction temperature can be maintained, the reactants thereby being heated to the reaction temperature within less than 10 minutes, and holding at the reaction temperature until the condensation reaction is complete.

4,701,282
β-HYDROXY-γ-KETOESTER FLAVORANT-RELEASE ADDITIVES

W. Geoffrey Chan, and Yoram Houminer, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 664,821, Oct. 25, 1984, Pat. No. 4,538,627.
This application Aug. 30, 1985, Ser. No. 771,492
Int. Cl.[4] C07C 69/003, 69/716; C07F 7/18
U.S. Cl. 260—410.9 R 11 Claims

1. A β-hydroxy-γ-ketoester composition corresponding to the formula:



where R and R^1 are substituents selected from aliphatic, alicyclic and aromatic radicals containing between about 1–12 carbon atoms, and R and R^1 when taken together with connecting elements form a cyclopentyl or cyclohexyl structure; each of R^2 is hydrogen or a substituent selected from aliphatic, alicyclic and aromatic groups containing between about 1–16 carbon

atoms; R^3 is a substituent selected from aliphatic, alicyclic and aromatic radicals containing between about 1–16 carbon atoms; and at least one of R^2 and R^3 is a substituent containing between about 5–16 carbon atoms.

4,701,283

PROCESS FOR PREPARING AMIDOALKANESULFONIC ACIDS

Hiroshi Itoh; Atsuhiko Nitta, both of Yokohama, and Hideo Kamio, Odawara, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

PCT No. PCT/JP83/00201, § 371 Date Feb. 16, 1984, § 102(e) Date Feb. 16, 1984, PCT Pub. No. WO84/00165, PCT Pub. Date Jan. 19, 1984

PCT Filed Jun. 22, 1983, Ser. No. 793,738

Claims priority, application Japan, Jun. 24, 1982, 57-107538

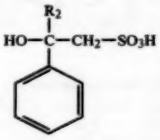
Int. Cl.⁴ C07C *143/155*

U.S. Cl. 260—507 R **7 Claims**

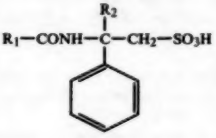
1. A process for preparing amido- and phenyl-substituted alkanesulfonic acids which comprises reacting a nitrile compound of the formula

$$R_1—C{\equiv}N$$

where R_1 is an alkenyl group having 1 to 12 carbon atoms, with an alkali metal salt of a B hydroxyalkanesulfonic acid of the general formula



wherein R_2 is hydrogen, an alkyl group having 1 to 4 carbon atoms or a phenyl group in concentrated sulfuric acid having a concentration of not less than 90 percent by weight to form a derivative of an amidoalkanesulfonic acid of the general formula



where R_1 and R_2 are as defined above; and, after the completion of the reaction, allowing the sulfate of amidoalkanesulfonic acid salt to deposit for separation and recovery as solid materials.

4,701,284

BRANCHED SULFOSUCCINAMIC ACID EMULSIFIERS FOR THE PRODUCTION OF PARTICULARLY SHEAR-STABLE DESPERSIONS

Udo W. Hendricks, Odenthal, and Adolf Schmidt, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

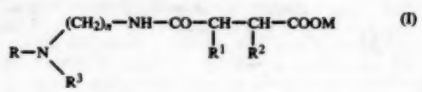
Filed Mar. 24, 1986, Ser. No. 843,305

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 3512335

Int. Cl.⁴ C07C *143/02*; B01F *17/00*

U.S. Cl. 260—513 N **2 Claims**

1. Sulfosuccinamic acids and derivatives thereof corresponding to the following formula



(I)

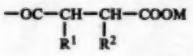
in which

R represents a linear or branched, saturated or unsaturated alkyl group containing from 8 to 22 carbon atoms or a group of the formula $R^4—O—(CH_2)_3—$, ($R^4 = C_8–C_2$ alkyl);

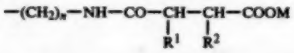
of the radicals

R^1 and R^2, one represents hydrogen and the other $—SO_3M^1$ and

R^3 represents a group corresponding to the formula



or to the formula



n is an integer of from 2 to 4 and M and M^1 independently of one another represent hydrogen or an alkali metal, an ammonium, $C_1–C_4$ alkylammonium or $C_2–C_3$ hydroxyalkylammonium group.

4,701,285

ACYL PHOSPHATE SALTS AND THEIR USE

George M. Whitesides, Newton; Debbie C. Crans, and Romas J. Kazlauskas, both of Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 591,174, Mar. 19, 1984. This application Oct. 31, 1985, Ser. No. 793,722

Int. Cl.⁴ C07C *153/00*

U.S. Cl. 260—545 P **13 Claims**

1. A method of preparing a monoacyl phosphate salt chosen from the group of sodium and potassium salts and mixtures thereof, comprising the steps of (a) reacting a phosphorus-containing compound selected from the group of phosphoric acid and phosphoric acid salts having the formula MH_2PO_4 or M_2HPO_4, where M is sodium or potassium, with an acylating agent selected from the group consisting of lower acyl anhydrides and halides in a organic solvent selected from the group consisting of esters and ketones, the molar ratio of phosphorous-containing compound to said organic solvent being between about 1:1 and 1:10 and the ratio of said acylating agent to said phosphorus-containing compound being between about 1:2 and 10:1, the reaction temperature being maintained between about 0° C. and 30° C.; (b) treating the resulting product with a basic sodium or potassium aqueous solution in an amount effective to maintain the pH between about 5 and 12 and to extract the acyl phosphate to water; (c) separating the acyl phosphate salt from the reaction mixture as an aqueous solution; and (d) extracting residual carboxylic acids from the aqueous solution of acyl phosphate.

4,701,286

APPARATUS FOR DISPENSING A WATER TREATING COMPOSITION INTO THE RECIRCULATING WATER OF AN EVAPORATIVE SYSTEM

Neil W. Stillman, and John T. Geiger, both of Milwaukee, Wis., assignors to Applied Biochemists Inc., Mequon, Wis.

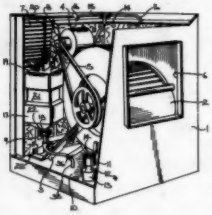
Filed Jun. 14, 1985, Ser. No. 744,693

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—36.1 **1 Claim**

1. An evaporative cooler assembly, comprising a housing

having an air inlet and an air outlet, a blower disposed within the housing, a plurality of evaporative pads enclosing said air inlet, a reservoir disposed in the lower portion of said housing, recirculating means for recirculating water from the reservoir and distributing said water to said pads, a container disposed within the housing and having a closed upper end and an outlet in the lower end, said container containing a liquid water treating composition, said container composed of generally flexible material and having a central waist portion of reduced cross section, a cap enclosing said outlet, conduit means having an inner end extending through the cap and having an outer



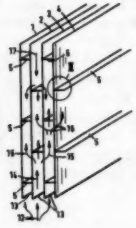
end disposed in spaced relation above the level of water in said reservoir, said composition being fed by gravity from said container through said conduit means to the reservoir, a conical valve seat with a small diameter upper end and a large diameter lower end disposed in said conduit means with the axis of said seat being disposed at an acute angle with respect to the axis of said conduit means, a conical valve means disposed to engage said seat for regulating the flow of said composition through said conduit means, and manually engageable means located outside of said conduit means and operably connected to said valve means for adjusting the position of said valve means.

4,701,287

APPARATUS FOR THE EXCHANGE OF MATERIAL AND/OR HEAT BETWEEN AND/OR FOR MIXING OF GASEOUS AND/OR LIQUID SUBSTANCES

Rolf P. C. Manteufel, Epiceadreef 11, B-2180 Kalmthout-Heide, Belgium

Continuation of Ser. No. 505,530, Jun. 17, 1983, abandoned. This application Aug. 30, 1985, Ser. No. 770,924
Claims priority, application Belgium, Jun. 28, 1982, 893557
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—81 **21 Claims**



7. An apparatus for arrangement in a fluid exchanger or mixer, comprising:

a plurality of walls essentially parallel with the direction of flow of said fluid in said apparatus, wherein said walls are permeable walls disposed in several layers side by side, which walls are kept at a distance from one another by essentially continuous spacing means located alternately at opposite sides of each of said walls thereby forming a multiplicity of interconnected chambers, said walls each having bulges or protuberances forming the spacing means between each of said walls, such that each of said walls is in the form of an endless ribbon of a corrugated surface;

each of said walls being formed of a permeable fabric having areas of variable permeability such that the areas adjacent to areas of contact between adjacent walls are less permeable with the difference in permeability being directly related to changes in loop width of the fabric forming said walls.

4,701,288

METHOD OF MAKING ARTICLES OF DISSIMILAR POLYMER COMPOSITIONS

William H. Cook, Fairport; William G. Deichert, Macedon; Richard J. Wrue, Rochester, and Norman R. Westfall, Penfield, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jun. 5, 1985, Ser. No. 741,382
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.4 **18 Claims**

1. The method of forming composite polymeric articles having dissimilar polymer segments which comprises:

(a) placing a quantity of a first polymerizable liquid vinyl monomer composition on the supporting surface of an open container;

(b) exposing a portion only of the first monomer composition to a predetermined pattern of actinic radiation and polymerizing in an inert atmosphere all of said exposed portion;

(c) contacting at least the periphery of the polymerized first monomer composition with a second polymerizable liquid monomer composition containing a vinyl monomer that is reactive with a vinyl monomer of the first monomer composition; and

(d) polymerizing said second monomer composition to create a composite article having dissimilar polymer compositions joined together.

14. Apparatus for manufacturing polymeric articles of precise dimensions from monomers which comprises:

(a) means for supporting a layer of polymerizable first monomer in a one-piece open container during polymerization;

(b) a source of actinic radiation for exposing the surface of said first monomer layer;

(c) means for confining the exposure of the surface of said first monomer layer to a predetermined pattern of actinic radiation;

(d) means for providing a uniform intensity of said actinic radiation throughout the pattern of exposure;

(e) first and second means for delivering the desired first and second monomer compositions to said open container; and

(f) means for providing an inert atmosphere adjacent surface of said monomer to be polymerized by actinic radiation; and

(g) means for confining the exposure of said first and second monomer compositions by actinic radiation to a predetermined pattern.

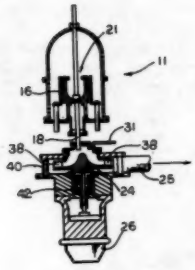
said means for supporting the layer of polymerizable monomer being substantially non-reflective of the actinic radiation.

4,701,289

METHOD AND APPARATUS FOR THE RAPID SOLIDIFICATION OF MOLTEN MATERIAL IN PARTICULATE FORM

Donald T. Liles, and John L. Speier, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Nov. 8, 1985, Ser. No. 796,369
Int. Cl.[4] B29B 9/10
U.S. Cl. 264—8 2 Claims



1. A method for solidification of molten material to particulate form, said method comprising atomization of molten materials to form a mist of finely divided molten material by expelling said molten material from the surface of a mechanical centrifugal atomizer into discharge tube, and introducing an atomized coolant or atomized mixture of coolants into the discharge tube, wherein the coolant or each coolant in a mixture of coolants has a boiling point below the temperature of solidification of the molten material and is a liquid at atmospheric temperature and pressure, and wherein an intimate mixture of said mist of atomized molten material and said atomized coolant or atomized mixture of coolants occurs off of the surface of the mechanical atomizer and in the space above said mechanical centrifugal atomizer or within the discharge tube, whereby the atomized mist of molten material is solidified and a particulate product is thereby formed.

2. A device for solidification of molten material to particulate form, said device comprising:

(A) a means of introducing a stream of molten material essentially directly onto the inclined surface of a cone shaped rotating disc with a plurality of vanes positioned radially with respect to the axis of rotation of said cone shaped rotating disc, wherein said cone shaped rotating disc has essentially no horizontal surface, whereby said molten material is expelled from said rotating disc to form an atomized mist of molten material;

(B) a discharge tube into which the atomized mist of molten material is expelled; and,

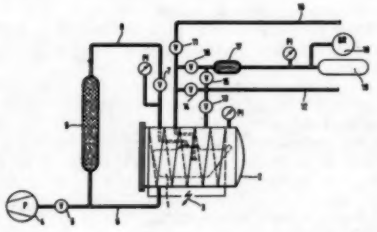
(C) a means for introducing into the discharge tube an atomized mist of finely divided coolant or coolants, whereby the coolant is or the coolants are added off center of, and not directly to the apex of, the cone shaped rotating disc thereby cooling the atomized mist of molten material by the transfer of the heat of said atomized mist of molten material to the atomized mist of finely divided coolant, whereby the cooling atomized molten material solidifies.

4,701,290

PROCESS FOR PREPARING FLUORIDATED SURFACES OF POLYMERS

Manfred Eschwey, Dusseldorf, and Rolf van Bonn, Duisburg, both of Fed. Rep. of Germany, assignors to Mexxer Griesheim GmbH, Fed. Rep. of Germany

Filed Mar. 13, 1986, Ser. No. 839,194
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1985, 3511743
Int. Cl.[4] B29C 41/08; C08F 8/18, 8/20, 8/22
U.S. Cl. 264—40.1 6 Claims



1. In a process for preparing fluoridated surfaces of polymers wherein the surfaces are exposed for a period of time to the influence of a fluorine containing treatment gas of definite amount in a tank for the purpose of forming fluoridated carbon compounds and fluoridated hydrocarbons, the improvement being in that a small portion of the definite amount of the treatment gas is drawn off from the tank during the exposure period and channeled via an activated aluminum oxide contact for the purpose of carrying out the reaction

$$Al_2O_3+3F_2 \rightarrow 2AlF_3+3/2O_2$$

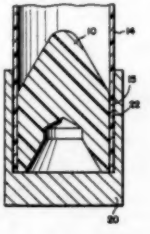
in order to determine the concentration of fluorine in the gas remaining in the tank after the small portion has been drawn off by means of the quantitative determination of the released oxygen and therewith the degree of fluorine coating of the surface.

4,701,291

PROCESS OF ISOSTATIC MOLDING AND BONDING FLUOROPOLYMERS

Jack L. Wissman, Xenia, Ohio, assignor to The Duriron Company, Inc., Dayton, Ohio

Filed Jul. 25, 1986, Ser. No. 890,188
Int. Cl.[4] B29C 65/02
U.S. Cl. 264—248 5 Claims



1. In the manufacture of a high purity bladder pump, the process of joining one end of a tubular bladder sleeve formed of PTFE with the outer surface of a cylindrical end plug

formed of PTFE received in and closing an end of said sleeve, comprising the steps of:

inserting said end plug within an end of said tubular sleeve for closing the end of said sleeve,

inserting said plug and sleeve within a cup-shaped metallic mold which mold has an inside surface which conforms closely to the adjacent outer surface of the sleeve,

heating by immersion of said mold in a molten bath to achieve fusion of said plug to said sleeve by reason of the differential cubic expansion of PTFE to said mold resulting in the formation of pressure on said plug and sleeve within said mold,

removing said mold from said bath and quenching said mold with water to cause more rapid cooling of said mold than the plug and sleeve components therein, thereby maintaining said pressure thereon during at least a portion of the quench.

4. The method of reconfiguring a quantity of high density high molecular weight polymer material such as PTFE, comprising the steps of:

supporting the quantity in a space between rigid metal mold members at least one of which has formed thereon a configuration different than that of said quantity, with the difference in volume between said mold members and said quantity closely approximating the difference in cubic expansion of said quantity and said members at an elevated temperature approaching or exceeding the melt temperature of said polymer,

heating said quantity and said mold members together to cause said quantity to expand to said differential configuration, and

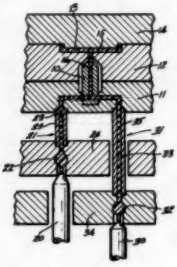
cooling said quantity and said members together to maintain pressure between said quantity and members during at least an initial portion of said cooling.

4,701,292

METHOD FOR PRESSURE MOLDING OBJECTS OF DIFFERENT RESINS

Emery I. Valyi, Stamford, Conn., assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Sep. 13, 1984, Ser. No. 650,041
Int. Cl.[4] B29C *45/16*
U.S. Cl. 264—255 **7 Claims**



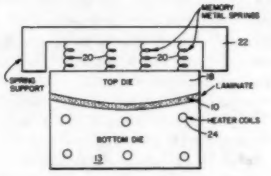
1. A method for pressure molding objects of at least two different resins in an injection molding cycle which comprises: providing an injection mold comprising a mold cavity; providing an injection nozzle having a single injection channel substantially throughout the extent thereof communicating with said injection mold; providing overflow means communicating with said nozzle; providing a source for a hot and flowable first resin and a source for a hot and flowable second resin communicating with said injection nozzle and with said single injection channel; first feeding said first resin under pressure from its source to said injection mold via a first manifold and via said nozzle and said single injection channel; discontinuing said first feeding after a predetermined quantity of said first resin has been discharged into said mold from said first source in an amount less than the capacity of said mold, leaving a portion of said first resin in said nozzle; second feeding said second resin under pressure from its source to said injection mold via a second manifold and via nozzle and said single injection channel, thereby forcing the quantity of first resin residing in said nozzle to pass into said injection mold; discontinuing said second feeding after a predetermined quantity of said second resin has been discharged from said second source, thereby leaving a portion of said second resin in said nozzle; third feeding sufficient first resin under pressure from its source to said nozzle to force the second resin in the nozzle out of said nozzle before commencing the next cycle, and including the step of feeding said first resin via said first manifold to force the second resin in said nozzle out of said nozzle and into said overflow means wherein the feeding steps cause only one material at a time to flow through said single injection channel cross section towards said injection mold, and wherein the pressure on one resin is diminished while the other resin is being fed by applying pressure thereto, with pressure application to one resin initiated by diminution of pressure on the other.

4,701,293

MOLDING PROCESS AND APPARATUS UTILIZING MEMORY METAL ALLOY SPRINGS

Albert R. Mead, Setauket, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 24, 1985, Ser. No. 779,767
Int. Cl.[4] B29C *33/02*; B30B *1/00*; B31F *1/00*; D21J *3/12*
U.S. Cl. 264—258 **7 Claims**



2. A molding apparatus comprising:

a first die upon which a first exposed surface of laminate sheets are placed;

a second die for contacting an opposite exposed surface of the sheets;

at least one spring fabricated of memory metal alloy and connected to the second die; and

means for applying heat to the laminate sheets and the spring for simultaneously curing bonding material which impregnates the sheets and expanding the spring to move the second die consequently generating sufficient force on the second die to mold the article.

6. A method for molding material comprising the steps:

positioning the material on a first die;

positioning a second die in spaced relation to the first die for molding the material therebetween;

mounting springs of memory metal alloy to the second die;

applying heat to the springs to expand them and move the second die thereby generating sufficient force on the second die to mold the article; and

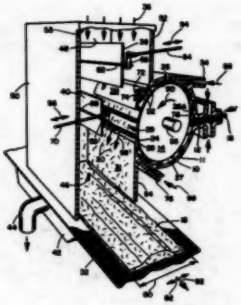
cooling the springs for contracting them and consequently displacing the second die thus permitting removal of molded material.

4,701,294

EDUCTOR AIRFORMING APPARATUS

Fred R. Radwanski, Norcross; Jark C. Lau, Roswell, both of Ga., and James L. Post, Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 13, 1986, Ser. No. 818,568
Int. Cl.[4] B29C *43/22*
U.S. Cl. 264—518 13 Claims



1. An apparatus for forming a fibrous web, comprising:

a. a distributor housing which delimits a fiberizing zone;

b. delivery means for supplying a frangible material into said fiberizing zone;

c. rotatable striking means located in said fiberizing zone for contacting said material within said fiberizing zone to initially separate said material into individual fibers, said striking means having an axis of rotation and having an outer peripheral surface which is moveable along a selected rotational direction;

d. discharging means for exiting said fibers from said fiberizing zone, into a web forming zone and toward a foraminous web forming layer, said forming layer being moveable along a direction approximately parallel to said striking means axis of rotation;

e. gas delivering means for forcing a stream of housing gas into said fiberizing zone, said zone delimited so as to cause said stream of housing gas to entrain said fibers therein and to eject a moving stream of said gas and fibers through said discharging means into said web forming zone, said stream of, housing gas having a velocity component which is substantially tangential to and co-directional with said rotational direction of said striking means peripheral surface, said ejected gas-fiber stream having a velocity sufficient to draw an induced supplementary gas flow past said discharging means and toward said foraminous forming layer, and said supplementary gas flow arranged to expand said gas-fiber stream across a transverse, width dimension of said forming layer; and

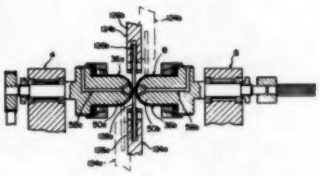
f. steering means located in said web forming zone for selectively deflecting said induced supplemental gas flow to join with said gas-fiber stream and thereby direct said fibers toward selected areas along the transverse, width dimension of said foraminous forming layer to form a fibrous web having a contoured cross-sectional profile along the transverse, width dimension of the fibrous web.

4,701,295

METHOD OF FORMING BOTTOMED CYLINDRICAL BODIES FROM A CYLINDRICAL BODY OF THERMOPLASTIC RESIN

Nobuyuki Kato, Yokohama, and Akira Kobayashi, Tokyo, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jun. 28, 1985, Ser. No. 749,844
Claims priority, application Japan, Jul. 5, 1984, 59-138019
Int. Cl.[4] B29B *13/02*; B29C *51/10, 57/10*
U.S. Cl. 264—519 3 Claims



1. A method of forming bottomed cylindrical bodies from a cylindrical body of thermoplastic resin, which comprises

a softening step of heat-softening an axially intermediate part of the cylindrical body,

a necking step of necking the axially intermediate part of the cylinderical body radially inwardly with a necking tool, said necking step being carried out subsequently to, or simultaneously with, the softening step, said cylindrical body being supported on and being rotated with two mandrels during the necking step, said mandrels having end portions of predetermined shapes and located opposite to each other inside the axially intermediate part of the cylindrical body, said necking step being performed by two necking means which are moved radially inwardly and axially toward each other along end portions of the mandrels,

a tension adjusting step of moving the mandrels axially during the necking step to move the end portions of the cylindrical body relative to each other to adjust the tension acting axially on the axially intermediate part of the cylindrical body,

a cutting step of cutting the axially intermediate part of the cylindrical body necked radially inwardly in the necking step, thereby to divide the cylindrical body into two members, and

a fusing step of heat-melting the cut end portion of each of the two members and fusing the cut end portion.

4,701,296

FUEL ARRAY FOR AN UNDERMODERATED NUCLEAR REACTOR

Jean-Paul Millot, Elancourt; Patrice Alibran, Paris, and Guy Desfontaines, Puteaux, all of France, assignors to Framatome & Cie., Courbevoie, France

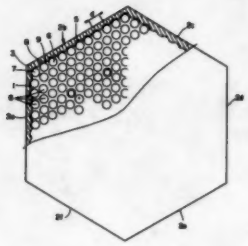
Continuation of Ser. No. 442,214, Nov. 16, 1982, abandoned.
This application Jun. 24, 1985, Ser. No. 748,136
Claims priority, application France, Dec. 4, 1981, 81 22751
Int. Cl.[4] G21C *3/30, 1/00*
U.S. Cl. 376—172 5 Claims

1. In an undermoderated light water moderated and cooled nuclear reactor comprising a core which consists of a plurality of fuel arrays of identical cross-section arranged side by side and comprising first fuel arrays which are located in a central portion of said core and which contain fissile enriched fuel material and second fuel arrays which are located at the periphery of said core and which contain fertile material only, each of said arrays having:

a prism shaped casing of regular polygonal cross section having lateral walls whose external surface is planar; and

a plurality of long cylindrical rods containing fissile enriched material in said first fuel arrays and containing fertile material only in said second arrays, said rods being arranged parallel to an axis of said casing and in a uniform triangular lattice within said casing, with a spacing between said rods which is so selected that the neutron flux in said core during operation of said reactor is epithermal;

the improvement consisting in that a plurality of parallel channels are formed out of an internal initially flat surface



of said lateral walls, each channel being part cylindrical and coaxial to an associated one of those of said rods which are placed in an outside row of the array, each of said rods having a spacing wire helically wound thereof for determining the spacing between adjacent ones of said rods and between the rods in the external row and the respective channels, said channels being so sized that the moderation ratio is substantially constant throughout a cross-sectional area of said array.

4,701,297

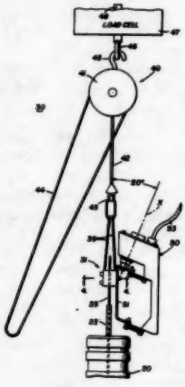
APPARATUS AND METHOD FOR REMOVING THERMOCOUPLES FROM NUCLEAR REACTOR VESSEL

William R. Pekarek, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 26, 1984, Ser. No. 654,698

Int. Cl.[4] G21C *19/00*

U.S. Cl. 376—260 **16 Claims**



1. A method for removing an elongated thermocouple from a thermocouple conduit which extends through the head of a nuclear reactor vessel, said method comprising the steps of: tensioning the thermocouple by gripping it at a predetermined location and pulling it longitudinally upwardly with a predetermined force, and directly vibrating the tensioning means and thereby the thermocouple by applying to the tensioning means at said predetermined location a vibratory force in a direction inclined at a predetermined angle with respect to the longitudinal axis of the thermocouple.

4,701,298

LOW CAPACITY NUCLEAR REACTOR PLACED UNDERGROUND IN THE CAVITY OF A CYLINDRICAL PRESSURE VESSEL

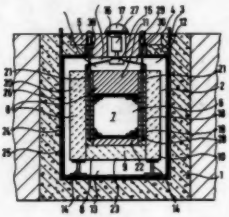
Josef Schoening, Hambruecken; Winfried Wachholz, Gorxheimertal, and Ulrich Weicht, Weinheim, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Fed. Rep. of Germany

Filed May 27, 1986, Ser. No. 866,921

Claims priority, application Fed. Rep. of Germany, May 25, 1985, 3518968

Int. Cl.[4] G21C *1/32*

U.S. Cl. 376—273 **14 Claims**



1. An underground nuclear reactor comprising:

a cylindrical pressure vessel;

a pile of spherical fuel elements located within a removable core vessel arranged within a cavity defined by said cylindrical pressure vessel;

an outer side reflector laterally disposed against an external surface of said removable core vessel;

an outer bottom reflector located beneath said removable core vessel;

an inner bottom reflector beneath said pile within said removable core vessel and removable therewith;

an inner side reflector surrounding said pile within the removable core vessel and removable therewith;

a plurality of channels in said inner side reflector;

absorber means for trimming and shutdown of said reactor displaceably disposed within said channels;

a roof reflector located within the removable core vessel and resting directly on said fuel elements;

said cylindrical pressure vessel having an opening in a cover region of sufficient size to allow removal of said removable pressure vessel;

a cover arranged in said opening;

blower means for forcing primary loop circulation of cooling gas downward through said pile arranged in said cover;

cooling system means for transferring heat generated in said pile from the pressure vessel arranged on an inner surface of said pressure vessel;

jacket means for gas tight sealing of said cooling system means against said cavity;

an annular space between said outer reflector and said jacket means for transport of said cooling gas;

means for structurally sealing said primary loop circulation and avoiding need of forced ventilation and filter devices;

wherein said primary loop and said cooling system means operate to safely remove decay heat following an accident.

4,701,299

MODULAR LINING FOR ADAPTING THE CONTAINMENT TO THE CORE OF A PRESSURIZED WATER NUCLEAR REACTOR

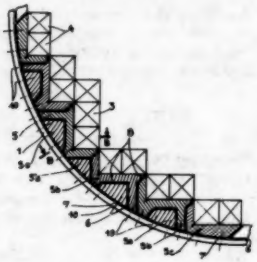
Patrice Alibran, Paris; Jean-Paul Millot, Elancourt, and Guy Desfontaines, Puteaux, all of France, assignors to Framatome & Cie, Courbevoie, France

Filed Jan. 5, 1984, Ser. No. 568,465

Claims priority, application France, Jan. 12, 1983, 83 00396

Int. Cl.[4] G21C 9/00

U.S. Cl. 376—302 9 Claims



1. In a water moderated and cooled nuclear reactor having a core with a periphery comprising a plurality of vertically standing adjacent assemblies of prismatic shape and a cylindrical core containment with a vertical axis around said core and separated therefrom by an annular space, a modular lining adapting the containment to the periphery of said core, said lining comprising:

a plurality of adjacent vertical columns of solid modular blocks having vertical surfaces and occupying substantially the whole volume of said annular sapce, each vertical surface of each of said modular blocks confronting a vertical surface of said core, said core containment, or another of modular blocks,

localized thin packing pieces separating all mutually adjacent ones of said vertical surfaces which are formed on said modular elements and core containment, said packing pieces being constructed and arranged for maintaining a gap for water flow between said adjacent surfaces, whereby thermal expansion and water cooling are possible,

and water cooled, threaded means for connection of each of said blocks to said cylindrical containment.

7. In a pressurized water reactor having a pressure vessel, a cylindrical containment envelope in said vessel having a vertical axis and defining with the reactor vessel a path for downward circulation of water, and a core consisting of a plurality of fuel assemblies of prismatic shape arranged vertically and side by side within said containment envelope and cooled by an upward flow of water which has previously circulated along said path, a modular lining which substantially fills an annular space between said containment envelope and said core and constitutes a neutron reflector, comprising:

mutually adjacent solid metal blocks having mutually confronting planar, surfaces separated by a narrow clearance, in continuous mutual abutment through thin spacers which maintain a path for circulation of cooling water which bypasses the upward water flow through the core, those of the blocks which are adjacent to the containment envelope being separated therefrom by additional spacers, thereby defining a narrow path with the envelope for circulation of cooling water,

and screw means cooled by an internal flow of water and securing said blocks to said containment envelope.

4,701,300

POLYAMIDE ESTER PHOTORESIST FORMULATIONS OF ENHANCED SENSITIVITY

Hans J. Merrem, Seeheim; Rudolf Klug, Aschaffenburg, and Thomas Herold, Brensbach, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jan. 15, 1986, Ser. No. 818,950

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1985, 3501028; Apr. 6, 1985, 3512544

Int. Cl.[4] G03C 1/71, 1/68, 1/70

U.S. Cl. 430—196 16 Claims

1. In a photoresist composition useful for forming a relief structure of a highly heat-resistant polyimide polymer, comprising, together in an organic solvent effective amounts of

(a) a polyamide ester prepolymer carrying photopolymerizable radicals,

(b) a radiation-reactive copolymerizable unsaturated compound, (a) and (b) being combinable to provide said polyimide polymer,

(c) a photosensitizer,

(d) a photoinitiator, and

(e) a leuco dye, the improvement wherein the photoinitiator is an N-azidosulphonylarylmaleimide photoinitiator and the leuco dye is a triarylmethane, the effective amounts of ingredients function to lower the minimum exposure energy of said composition to a value below 20 $mJ/c^2.\mu m$.

4,701,301

PROCESS FOR PRODUCING AN INTERNAL-OXIDIZED ALLOY OR A SHAPED ARTICLE THEREOF

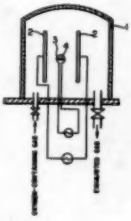
Hideyuki Kuwahara, Nagaokakyo; Bunji Kondo; Jun Takada, both of Kyoto; Kenji Yanagihara; Mituo Kimura, both of Yokohama, and Masahiro Niinomi, Machida, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo and Applied Science Research Institute, Kyoto, both of, Japan

Filed Jul. 16, 1986, Ser. No. 886,039

Claims priority, application Japan, Jul. 26, 1985, 60-163958

Int. Cl.[4] B22F 1/00

U.S. Cl. 419—21 10 Claims



1. A process for producing an internal-oxidized alloy, which comprises allowing a plasma generated in the presence of oxygen, a gas of an oxygen atom-containing compound or a mixture of oxygen and a gas of an oxygen atom-containing compound to act on an alloy consisting of at least two metal elements, thereby selectively oxidizing at least one metal element other than the matrix metal in said alloy.

4,701,302
FILLER METAL FOR WELDING

Erich Dommer; Bruno Rechtziegel, both of Heuchelheim, and Klaus Tauber, Biebertal, all of Fed. Rep. of Germany, assignors to Berkenhoff GmbH, Heuchelheim-Kinzenbach, Fed. Rep. of Germany

Filed Jul. 8, 1986, Ser. No. 883,263

Claims priority, application European Pat. Off., Jul. 11, 1985, 85108631.4

Int. Cl.[4] C22C *9/01*

U.S. Cl. 420—470 **4 Claims**

1. A filler metal for the welding of steel and iron, copper and copper alloys, consisting essentially of the following composition in percentage by weight:

0.01–2.5% Si,

0.1–0.4% Sn,

0.6–1.5% Mn,

0.005–0.020% P and/or

0.002–0.020% B,

the sum of P and B being less than 0.020%, the remainder being copper, the amount of Pb present as an impurity being

less than 0.02%, and the total amount of impurities other than Pb being less than 0.5%.

4,701,303
ODOR-FADING PREVENTION FROM ORGANOSULFUR-ODORIZED LIQUEFIED PETROLEUM GAS

Ashley D. Nevers, 569 Crossfield Rd., King of Prussia, Pa. 19406

Filed May 15, 1986, Ser. No. 863,332

Int. Cl.[4] B01J *11/18*

U.S. Cl. 422—41 **8 Claims**

1. A process for the prevention of odor-fading from organosulfur-odorized LPG stored in containers having active interior steel surfaces comprising treating said surfaces with a deacativating amount of benzotriazole, tolyl triazole, mercaptobenzothiazole, benzothiazyl disulfide, or mixtures thereof, and loading said container with liquefied petroleum gas odorized with at least one reduced organosulfur compounds containing one to five carbon atoms.

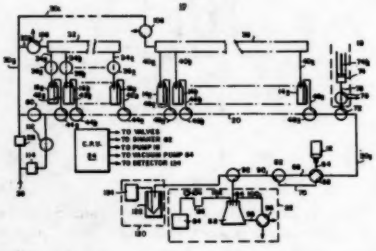
4,701,304
APPARATUS FOR AUTOMATED SYNTHESIS OF PEPTIDES

Marcus J. Horn, Arlington, and William K. Miller, Sharon, both of Mass., assignors to Applied Protein Technologies, Inc., Cambridge, Mass.

Filed Apr. 19, 1985, Ser. No. 725,213

Int. Cl.[4] B01J *14/00*; G01N *33/68*

U.S. Cl. 422—62 **6 Claims**



1. A system for the solid-phase synthesis of peptides by successive amino-acid additions to peptide chains anchored to a solid support matrix, the system comprising:

A. a reaction vessel enclosing the solid support matrix and comprising

(1) a single port for bidirectional flow therethrough into and out of the vessel, and

(2) a porous filter positioned in the vessel adjacent the single port for retaining the solid support matrix in the reaction vessel while allowing passage of fluids from the vessel;

B. a plurality of reservoirs, each containing a solvent or reagent, or an amino acid used for the synthesis of said peptide;

C. means for supplying a reference pressure to the vessel and the reservoirs and the rest of the system;

D. means for removing a predetermined continuously variable volume of gas from the vessel; and

E. means for displacing said removed volume of gas with a predetermined volume of a selected solvent, reagent or amino acid from one of said reservoirs in response to the difference in pressure between the reference pressure and the pressure in the vessel.

4,701,305
DEVICE FOR SAMPLING BLOOD AND MEASURING ERYTHROCYTE SEDIMENTATION RATE

Hiroyuki Hattori, Kyoto; Takashi Uemura, and Toshio Yamauchi, both of Otsu, all of Japan, assignors to Nissho Corporation, Osaka, Japan

Filed Jun. 25, 1986, Ser. No. 878,536

Claims priority, application Japan, Sep. 6, 1985, 60-136786[U]

Int. Cl.[4] G01N *33/86, 33/16*

U.S. Cl. 422—73 **6 Claims**

1. A device for sampling blood and measuring erythrocyte sedimentation rate which comprises:

a tube with one closed end and one open end;

said tube having a blood sampling portion provided on the open end of said tube and a scale portion for measuring an erythrocyte sedimentation rate extending from said blood sampling portion;

a stoppering means for stoppering the open end of said tube to keep the inside of said tube at a vacuum, said stoppering means being capable of being pierced with a blood drawing needle; and

a plate-shaped partition member located within and separate from said tube and which extends substantially over the

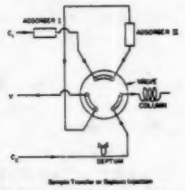
entire length of said tube, wherein the width of the partition member is substantially equal to the inner diameter of said scale portion.

4,701,306

CONCENTRATOR FOR DETECTION OF AMINE VAPORS

André H. Lawrence, Ottawa, and Lorne Elias, Nepean, both of Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Jun. 5, 1984, Ser. No. 617,575
Int. Cl.[4] G01N *1/00, 1/22*
U.S. Cl. 422—101 **9 Claims**



1. An air sample concentrator consisting essentially of:

(a) a porous highly aromatic organic polymeric adsorbent which adsorbs and preferentially retains amines on heating to temperatures sufficient to desorb moisture, and releases adsorbed amines at higher temperatures, said adsorbent being stable at said higher temperatures,

(b) a soda lime alkaline adsorbent material which neutralizes acids and readily releases amines and moisture on heating, (b) being positioned upstream of (a) and being in flow communication therewith so as to minimize access of moisture and acids in an air sample to (a),

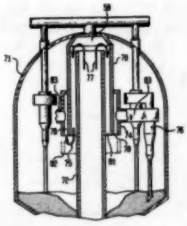
and (c) containing-means confining (a) and (b) in place and providing flow communication between (a) and (b), and having an air inlet adjacent adsorbent (b) and an air outlet adjacent adsorbent (a).

4,701,307

VENTED RISER

Paul W. Walters, Ashland, and Roger M. Benslay, Catlettsburg, both of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 652,351, Sep. 19, 1984, abandoned. This application May 6, 1986, Ser. No. 860,264
Int. Cl.[4] B01J *8/18*
U.S. Cl. 422—147 **23 Claims**



1. An apparatus including means for separating particulates from a mixture of particulates and vapors comprising:

(A) a disengaging chamber serving as a reservior for the collection of solid particulates;

(B) longitudinal transport means for transporting the mixture, which has a downstream end having an axial opening which is totally within said disengaging chamber;

(C) means defining a conduit chamber surrounding at least a portion of said downstream end which does not directly impinge particulates that travel in a path determined by said axial opening of said transport means, wherein said chamber:

a. comprises a wall-surface which does not restrict said axial opening of said transport means and wherein said chamber is defined between the extension surface of said transport means and interior surface of said wall-surface.

b. has means defining a fluid opening at substantially opposite ends so as to define an entrance and an exit; and

c. includes means defining a vapor-take-off-exit at a location intermediate to said entrance and said exit, which is adapted for fluid communication with a second means for separating said particulates from vapors, wherein the ratio of length, from the exit of said conduit chamber to the vapor-take-off-exit of said conduit chamber, to inside diameter of the transport means is at least 2.

4,701,308

PROCESS FOR THE RECOVERY OF MOLYBDENUM-99 FROM AN IRRADIATED URANIUM ALLOY TARGET

Gérard Koehly, Bievres, and Charles Madic, Thiais, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 10, 1985, Ser. No. 806,815
Claims priority, application France, Dec. 28, 1984, 84 20011
Int. Cl.[4] C01G *39/00*
U.S. Cl. 423—2 **12 Claims**

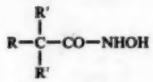
1. A process for the recovery of molybdenum-99 from an irradiated uranium alloy target, wherein it comprises the following stages:

(a) dissolving the irradiated uranium alloy target in sulphuric acid,

(b) separating the iodine and tellurium present in the thus obtained solution,

(c) oxidizing the molybdenum-99 present in the solution Mo(VI), and

(d) extracting the thus oxidized molybdenum-99 with a hydroxamic acid of formula:



(I)

in which R is a radical chosen from the group including straight or branched-chain alkyl radicals, the phenyl radical, phenyl radicals substituted by at least one alkyl radical, arylalkyl radicals and the cyclohexyl radical and R' is a hydrogen atom or an alkyl radical.

4,701,309

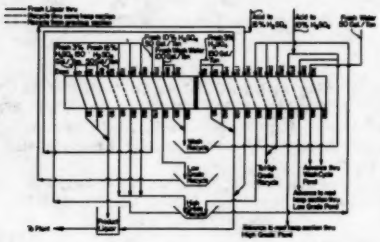
METHOD OF OPERATING A HEAP LEACH FOR RECOVERING URANIUM AND VANADIUM

Sundaresan Ramachandran, Tonawanda, N.Y.; David O. Skiles, Grand Junction, Colo., and Donald J. Hansen, Lewiston, N.Y., assignors to Umetco Minerals Corporation, Del.

Filed Nov. 30, 1984, Ser. No. 676,843
Int. Cl.[4] C01G *43/00, 31/00*
U.S. Cl. 423—20 **7 Claims**

1. A method of operating a heap leach for leaching uranium and vanadium from a uranium-vanadium bearing ore formed into a relatively tall heap from a mixture of coarsely crushed ore and concentrated sulfuric acid which comprises leaching the heap in sections with each section being leached in multiple cycles in accordance with a leaching operation comprising the steps of:

(a) applying a dilute solution of between 1 to 5% sulfuric acid to the first section at a first predetermined average flow rate over a first predetermined time period;
(b) directing the leach liquor output from step (a) into a product liquor sump for direct delivery to a processing plant for substantially extracting uranium values;
(c) applying a substantially stronger acid solution of between 10 to 20% H_2SO_4 to the first section upon completion of step (a);
(d) directing the leach liquor output from step (c) into a high grade recycle pond;
(e) recycling the leach liquor from the high grade recycle pond through the first section a predetermined multiple number of times with the last cycle advanced from the first section into the second section in substantial time coincidence with the completion of the dilute acid application to the second section as set forth in step (g);
(f) directing the output leach liquor from step (e) into the product liquor sump for direct delivery to the processing



plant for substantially extracting uranium and vanadium values;
(g) applying a fresh dilute acid solution as defined in step (a) to each section in a timed sequence upon substantial completion of the dilute acid application to the preceding section;
(h) directing the leach liquor output of each section from step (g) to the product liquor sump as set forth in step (b);
(i) applying acid solution adjusted to the level as defined in step (c) to each section in succession following the completion of step (g) in each corresponding section respectively;
(j) directing the output leach liquor from step (i) into the high grade recycle pond; and
(k) recycling the leach liquor from the high grade pond of step (j) through each section a predetermined multiple number of times with the last cycle passed through the next section in succession before being sent to the product liquor sump in accordance with step (f).

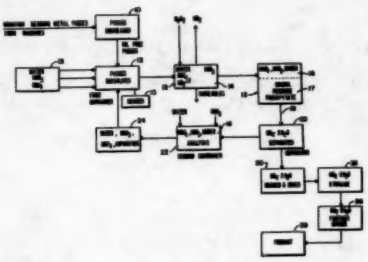
4,701,310

METHOD AND APPARATUS FOR PRODUCING URANYL PEROXIDE ($UO_4.2H_2O$) FROM URANIUM AND URANIUM ALLOY PIECES

Eugene N. Pollock, Needham, Mass., assignor to Nuclear Metals, Inc., Mass.

Filed May 24, 1985, Ser. No. 737,523
Int. Cl.[4] C01G *43/01*
U.S. Cl. 423—16 **17 Claims**

1. A method of producing uranyl peroxide ($UF_4.2H_2O$) from uranium-bearing metal pieces comprising:
dissolving the uranium-bearing metal pieces in a first aqueous solution containing nitric acid and at least 0.5% but no more than 2.0% fluoboric acid to provide a second aqueous solution which includes uranyl ions (UO_2^{+2}) and nitric and fluoboric acids;
adding hydrogen peroxide to said second aqueous solution to precipitate uranyl peroxide out of said second solution and provide a third aqueous solution containing nitric and fluoboric acid; and



separating said uranyl peroxide from said third aqueous solution.

4,701,311

PROCESS FOR SEPARATING ARSENIC FROM ACID SOLUTIONS CONTAINING IT

Agostino Baradel, Milan; Renato Guerriero, Mestre, and Giuseppe Veronese, Padua, all of Italy, assignors to Consiglio Nazionale Delle Richerche, Rome, Italy

Filed Oct. 24, 1985, Ser. No. 791,105
Claims priority, application Italy, Oct. 25, 1984, 84141 A/84
Int. Cl.[4] C01B *27/00*
U.S. Cl. 423—87 **26 Claims**

1. A process for separating arsenic ions from an acid aqueous solution consisting essentially of:
(a) treating the acid solution with an organic extractant in an organic diluent to obtain an organic phase comprising extractant diluent, and arsenic, and an aqueous phase; and
(b) treating the organic phase with a countersolvent to strip the arsenic therefrom; characterized in that the extractant is a compound of the formula (I):

$$C_6R_n(OH)_mH_{6-(m+n)} \quad (I)$$

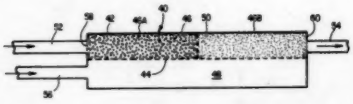
in which
C_6 is an aromatic nucleus;
R is an alkyl; alkenyl; cycloalkyl; or arylalkyl radical substituting the aromatic nucleus;
OH is hydroxyl substituting the aromatic nucleus;
n is a whole number from 1 to 4; and
m is a whole number from 2 to 4.

4,701,312

FLUIDIZED BED CATALYTIC CONVERTER

Warren B. Kice, 6318 Riverside La., Dallas, Tex. 75248

Division of Ser. No. 426,891, Sep. 29, 1982, abandoned. This application Dec. 18, 1984, Ser. No. 682,498
Int. Cl.[4] F01N *3/15*; B01J *8/18*
U.S. Cl. 423—213.7 **6 Claims**



1. A two-stage method of catalytically converting exhaust gases from an internal combustion engine, comprising the steps of successively passing exhaust gases through two chambers respectively containing beds of catalytic material of different compositions selected to react with components in said exhaust

gases to remove said components from said gases, and passing air through at least one of the said beds of catalytic material at a velocity to minimize plugging of catalytic material and to fluidize the catalytic material and promote a reaction between the catalytic material and said components.

4,701,313

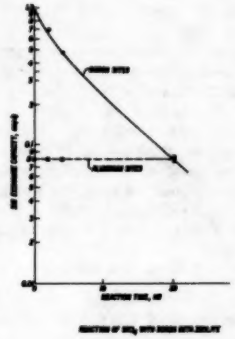
REPLACING BORON WITH SILICON IN ZEOLITE BETA USING $SiCl_4$

Clarence D. Chang, Princeton, N.J., and Paul B. Weisz, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 683,768, Dec. 19, 1984, abandoned. This application May 13, 1986, Ser. No. 864,746

Int. Cl.[4] C01B *33/20*

U.S. Cl. 423—277 **5 Claims**



1. A process for controlled production of siliceous zeolite having an aluminum content comprising:

providing a boron-containing Zeolite beta, with initial aluminum and boron contents each greater than the numeral 0;

treating the zeolite with silicon tetrachloride at a temperature and for a time sufficient to replace boron with silicon; and

recovering a siliceous zeolite having a reduced boron content but preserving said initial content of aluminum.

4,701,314

METHOD OF PRODUCING MICROSIZED AMORPHOUS PARTICLES OF METAL PHOSPHATE

Lawrence D. David, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1986, Ser. No. 924,703

Int. Cl.[4] C01B *15/16, 25/16*

U.S. Cl. 423—311 **17 Claims**

1. A process for producing microsized amorphous particles of a metal phosphate comprising,

forming a solution of a metal alkoxide in an organic solvent, said organic solvent being immiscible with water, having a density less than that of water,

forming an aqueous phosphoric acid solution,

introducing said metal alkoxide solution and said phosphoric acid solution into a reaction vessel, said solutions being immiscible and forming two separate liquid phases with an interface,

applying agitation to at least the region of the interface to promote a controlled reaction between said metal alkoxide and said phosphoric acid at said interface,

collecting the reaction product of said metal alkoxide and phosphoric acid,

firing said reaction product in an oxygen-containing environment at a temperature sufficiently high to drive off the organic residue in said reaction product, wherein the metal of said metal alkoxide is a metal selected from the group consisting of Al, Cr, Ni and Sn, and mixtures thereof.

4,701,315

ZEOLITE L AND PROCESS FOR ITS PREPARATION

Theodorus M. Wortel, Houston, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

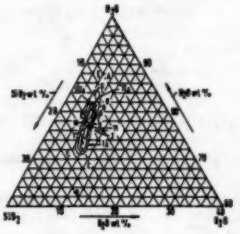
Continuation of Ser. No. 493,688, May 11, 1983, Pat. No. 4,544,539. This application Apr. 18, 1985, Ser. No. 724,672

Claims priority, application United Kingdom, May 14, 1982, 8214147

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—328 **27 Claims**



1. A process for the preparation of a zeolite having an x-ray diffraction pattern obtained from CuK_α radiation with the significant d values set out in Table A hereinbefore and comprising highly crystalline crystallites having at least 50% of its crystallites in the form of distinct circular cylinders with a mean diameter of at least 0.5 micron and an aspect ratio of at least 0.5, in which process an alkaline reaction mixture consisting essentially of water, a source of silicon consisting essentially of a colloidal suspension of silica and a source of aluminum and having a composition (expressed in the mole ratios of oxides) of:

$$M_{2/n}O/SiO_2=0.22\text{–}0.36$$

$$H_2O/M_{2/n}O=25\text{–}90$$

$$SiO_2/Al_2O_3=5.7\text{–}7.4$$

(wherein M is a cation of valence n) is heated to a temperature of from at least 75° C. to form the said cylindrical zeolite L.

4,701,316

PREPARATION OF SILICON NITRIDE POWDER

George R. Lester, Park Ridge; Stephen T. Gonczy, Mt. Prospect; Lawrence B. Welsh, Evanston, and Gerald T. Stranford, Palatine, all of Ill., assignors to Allied Corporation, Morristown, N.J.

Filed Aug. 29, 1986, Ser. No. 901,672

Int. Cl.[4] C01B *21/063, 33/06*

U.S. Cl. 423—344 **17 Claims**

1. A process for the production of silicon nitride powder which comprises treating a silica support having a surface area in the range of from about 1 to about 500 m^2/g by impregnating said support with an organic pyropolymer precursor, pyrolyzing said treated silica support at a temperature in the range of from about 400 to about 1200° C. and at a pressure in the range of from about atmospheric to about 100 atmospheres to form a carbonaceous pyropolymer possessing recurring units containing at least carbon and hydrogen atoms composited on

the surface of said silica support, subjecting said support to nitriding conditions including a nitrogen-containing atmosphere which comprises a mixture of nitrogen and hydrogen to yield silicon nitride powder, and recovering the resultant silicon nitride powder.

4,701,317

HIGHLY ELECTROCONDUCTIVE FILMS AND PROCESS FOR PREPARING SAME

Tatsumi Arakawa; Masaru Ozaki, and Yukihiro Ikeda, all of Fuji, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Continuation of Ser. No. 664,031, Oct. 23, 1984, abandoned. This application Sep. 8, 1986, Ser. No. 904,823

Claims priority, application Japan, Jun. 14, 1983, 58-104961; Dec. 12, 1983, 58-232656

Int. Cl.[4] C01B *31/00, 31/02, 31/04;* **A23L** *1/27*

U.S. Cl. 423—445 **16 Claims**

1. A highly electroconductive carbonaceous film having an electrical conductivity of at least 1000 S/cm, which is obtained by thermally decomposing a diethynylbenzene in a carrier gas composed of an inert gas.

4,701,318

STABLE ANTIPLAQUE DENTIFRICE

Robert J. Ferlauto, Jr., Edison, and Kathleen M. Yuhasz, Fords, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 648,926, Sep. 10, 1985, abandoned. This application Apr. 25, 1986, Ser. No. 855,993

The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.[4] A61K *7/16, 7/18, 7/22;* **B01J** *13/00*

U.S. Cl. 424—52 **8 Claims**

1. A process of preparing a cosmetic and chemically stable antiplaque dentifrice comprising an effective antiplaque amount of a quaternary ammonium compound, about 3 to 5% by weight betaine surfactant, about 0.5 to 2% by weight flavor, about 18 to 23% by weight of at least one of glycerine and sorbitol humectants, and about 0.8 to 1.5% by weight of a nonionic gelling agent, consisting essentially of the formation of two separate phases, an oil gel phase and a water gel phase prior to combining the two gel phases into a parent gel phase, comprising the following sequence of steps:

a. dispersing the formula amount of a quaternary ammonium antiplaque agent in the formula amount of flavor,

b. mixing said quaternary ammonium-flavor dispersion into the formula amount of betaine surfactant to form the oil gel phase,

c. dispersing the formula amount of a nonionic gelling agent in the formula amount of glycerin and/or sorbitol humectant,

d. mixing said gelling agent-humectant dispersion with the formula amount of water to form the water gel phase,

e. mixing the two gel phases to form a stable parent gel phase,

f. adding the dental abrasive to the water gel phase or to the parent gel phase with mixing, and

g. recovering a stable antiplaque dentifrice.

4,701,319

TOOTHPASTE COMPOSITIONS

Ricky A. Woo, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 14, 1984, Ser. No. 650,757

Int. Cl.[4] A61K *7/16, 7/18*

U.S. Cl. 424—52 **10 Claims**

1. A toothpaste composition comprising:

a. from about 6% to about 35% of a silica dental abrasive;

b. from about 20% to about 70% of a humectant;

c. from about 0.01% to about 0.8% of a carboxyvinyl polymer;

d. from about 0.1% to about 1.7% of an iota form carrageenan; and

e. q.s. 100% water;

said composition providing a pH of from about 6.0 to about 8.0 when slurried with water in a 3:1 water:composition weight ratio and the weight ratio of carrageenan:carboxyvinyl polymer is from about 100:1 to about 1.2:1.

4,701,320

COMPOSITION STABLY CONTAINING MINOCYCLINE FOR TREATING PERIODONTAL DISEASES

Kenji Hasegawa, Ibaraki; Koichi Nakashima, Takatsuki; Tohru Eguchi, Takatsuki, and Masako Ota, Osaka, all of Japan, assignors to Lederle (Japan), Ltd., Japan

Filed Nov. 26, 1985, Ser. No. 801,812

Claims priority, application Japan, Nov. 29, 1984, 59-253877; Nov. 22, 1985, 60-263318

Int. Cl.[4] A61K *7/22, 7/16, 33/06*

U.S. Cl. 424—54 **20 Claims**

1. A pharmaceutical composition in the form of non-aqueous paste stably containing minocycline for topical application to treat periodontal diseases which comprises:

(a) 0.1 to 15% by weight of minocycline or a pharmaceutically acceptable salt thereof, and

(b) a base comprising an alkane-diol or an alkane-triol having 2 to 6 carbon atoms, and 0.5 to 10% by weight of a magnesium compound selected from the group consisting of magnesium chloride, magnesium acetate, magnesium sulfate, magnesium carbonate, magnesium gluconate and hydrates thereof.

4,701,321

LIQUID DETERGENT WITH SUNSCREEN AGENT

Joel E. Bernstein, Deerfield, Ill., assignor to Soft Sheen Products, Inc., Chicago, Ill.

Continuation of Ser. No. 375,476, May 6, 1982, abandoned. This application Apr. 18, 1984, Ser. No. 601,117

Int. Cl.[4] A61K *7/44, 7/42*

U.S. Cl. 424—60 **19 Claims**

1. A method of controlling the absorption of ultraviolet light by skin exposed to ultraviolet light, comprising the steps of (1) taking a liquid combination sunscreen detergent comprising (a) a liqud detergent component consisting essentially of an aqueous solution of a non-ionic detergent, an amphoteric detergent or mixtures thereof and (b) an amount of a sunscreen agent sufficient to leave an effective amount of said sunscreen on the skin even after rinsing to substantively reduce the absorption of ultraviolet light by said skin so as to provide noticeable protection from sunburn; (2) periodically applying said sunscreen detergent to the skin; and (3) rinsing said sunscreen detergent from the skin prior to exposure of the skin to the ultraviolet light.

4,701,322

CONDITIONING SHAMPOO

Thomas J. Dixon, Cincinnati, and Vernon A. Uchtman, Green Hills, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 142,297, Apr. 21, 1980. This application Feb. 28, 1985, Ser. No. 706,898

Int. Cl.[4] A61K *7/06*

U.S. Cl. 424—70 **8 Claims**

1. A shampoo composition consisting essentially of

(a) from about 10% to about 26% of a synthetic anionic surfactant;

(b) from about 1% to about 3% of a saturated, straight chain fatty acid selected from the group consisting of palmitic acid, myristic acid and mixtures thereof; and

(c) water, wherein said composition has a pH of from about 3.0 to about 5.5.

4,701,323

VACCINES FOR COUNTERACTING INHIBITION OF NEUTROPHIL DEGRANULATION

James A. Roth; Peter C. Canning, and Yu-Wei Chiang, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 23, 1985, Ser. No. 790,343
Int. Cl.[4] A61K *39/02, 39/385*
U.S. Cl. 424—88 17 Claims

1. A vaccine for counteracting inhibition of neutrophil degranulation by pathogenic cellular microorganisms, comprising an aseptically-packaged, parenterally-administrable sterile aqueous solution of at least one purine conjugated to an antigenic protein, each of said conjugated purines containing adenine or guanine as a base, nucleoside, or nucleotide thereof, the amount of said conjugated purine in said packaged vaccine providing single or multiple vaccine doses effective for generating antibodies to adenine and/or guanine.

4,701,324

NOVEL CELL-CIDAL ANTIBIOTIC 82-85-8A AND ITS PRODUCTION

Kanki Komiyama; Shinji Funayama, both of Yokohama, and Iwao Umezawa, Tokyo, all of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Filed Nov. 18, 1985, Ser. No. 799,724
Claims priority, application Japan, Mar. 27, 1985, 60-60833
Int. Cl.[4] A61K *35/74*; C12P *1/06*
U.S. Cl. 424—118 3 Claims

1. A member selected from the group consisting of antibiotic 82-85-8A of the following physico-chemical properties:

(1) Elementary analysis: $C_{31}H_{47}N_8O_{10}Cl$ (determined by high resolution mass spectrometry)

(2) Molecular weight: 726.5 (determined by field desorption mass spectrometry and calculated from elementary analysis)

(3) Melting point: 162°–167° C. (partially immersed at 160° C., completely melted at 167° C., no browning)

(4) Specific rotation: $[\alpha]_D^{20} = -56°$ (c=0.24, methanol)

(5) Ultraviolet absorption spectrum (in methanol): shown in FIG. 1

(6) Infrared absorption spectrum (KBr): shown in FIG. 2

(7) Solubility:

soluble: chloroform, dichloromethane, ethyl acetate, methanol, ethanol,

slightly soluble: acetone,

insoluble: hexane, water;

(8) Color reaction:

Positive: iodine, sulfuric acid, Dragendorf reaction

Negative: ninhydrin, ferric chloride

(9) Nature: weakly basic substance,

and a pharmacologically acceptable non-toxic salt thereof.

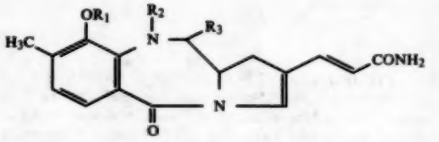
4,701,325

INJECTABLE AQUEOUS SOLUTION CONTAINING HYDROGENSULFITE AND/OR SULFITE AND ANTICANCEROUS BENZODIAZEPINE COMPOUND

Yasuo Ueda, Hirakata; Yoshio Kagitani, Kashihara; Shirou Komeda, Tondabayashi, all of Japan, and Satoshi Funakoshi, Los Angeles, Calif., assignors to The Green Cross Corporation, Osaka, Japan

Filed Feb. 15, 1984, Ser. No. 580,183
Claims priority, application Japan, Feb. 17, 1983, 58-25996
Int. Cl.[4] A61K *33/04, 31/55*
U.S. Cl. 424—164 7 Claims

1. An injectable aqueous solution containing a physiologically acceptable metal hydrogensulfite and/or sulfite and an effective amount for controlling tumor of a benzodiazepine compound of the formula



wherein R_1 represents a hydrogen atom, an alkanoyl group having 1 to 6 carbon atoms, a benzoyl group, a phenylcarbamyl group, an alkyl carbamyl group having 1 to 6 carbon atoms, or alkoxycarbonyl group wherein the alkoxy portion has 1 to 6 carbon atoms; R_2 represents a hydrogen atom, an alkanoyl group having 1 to 6 carbon atoms or a benzyl group; and R_3 represents a sulfinic acid residue, SO_2X, or sulfonic acid residue, SO_3X, in which X represents hydrogen, alkali metal or alkaline earth metal, wherein the amount of the hydrogensulfite and/or sulfite is 5–15 times the amount of the benzodiazepine compound.

4,701,326

MEMBRANE-COATED HYDROGEL ENCAPSULATED NEMATODES

Charles E. Nelsen, and Catharine Mannion, both of Davis, Calif., assignors to Plant Genetics, Inc., Davis, Calif.

Division of Ser. No. 790,337, Oct. 23, 1985, Pat. No. 4,615,883.
This application May 19, 1986, Ser. No. 864,832
Int. Cl.[4] A01N *63/00*
U.S. Cl. 424—408 5 Claims

1. An insecticidal composition comprising

a membrane-coated hydrated hydrogel capsule matrix encapsulating and containing, without excess viscosity-caused damage, an insecticidally effective amount of at least one nematode having an associated entomogenous bacteria, usually found in the intestinal lumen, which, following ingestion of the nematode by an insect host, said entomogenous bacteria will be released and multiply to produce fatal septicaemia in the insect host,

which capsule allows nematode respiration by permitting diffusion of gases and has sufficient hydration to maintain the viability and infectivity of said nematode; and

said membrane-coated capsule being strong enough to resist external abrasion yet being pliable enough to allow the eventual release of the nematode or injestion by the insect;

said membrane comprising a capsule membrane substantially coating said capsule, which membrane is capable of reducing the rate of water loss from said capsule;

said capsule ranging in size from approximately 0.4 to 5 millimeters in diameter and containing approximately 250 to 50,000 nematodes per milliliter, the interior of the capsule remaining wet and having a free water content in excess of 50 percent, said free water being immediately available to the nematodes in the capsule, thereby providing the anti-dessication moisture element for maintaining nematode viability and infectivity.

4,701,327

ETOPOSIDE SOFT CAPSULES

Yoshiyasu Henmi, Tokyo; Takashi Terada, Yono; Masaru Suzuki, Tokyo, and Hiroshi Ninomiya, Sayama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1985, Ser. No. 729,993
Claims priority, application Japan, May 15, 1984, 59-95657
Int. Cl.[4] A61K *9/66*
U.S. Cl. 424—455 3 Claims

1. An etoposide soft capsule comprising a soft gelatin shell of about pH 4.0 to about pH 5.5 having enclosed therein, an etoposide solution containing an organic acid having 1 to 3 carboxyl groups and 1–6 carbon atoms; a solvent of said etopo-

side solution being a polyhydric alcohol which is liquid at room temperatures.

4,701,328

COMPOSITIONS FOR FEEDING ANIMALS

Daniel Bercovici, Nice; Hubert Gaertner, and Antoine Puigserver, both of Marseilles, all of France, assignors to A.E.C. Societe de Chimie Organique et Biologique, Commentry, France

Filed Jan. 31, 1986, Ser. No. 824,470
Claims priority, application France, Feb. 1, 1985, 85 01418
Int. Cl.[4] A23K *1/00, 1/22*
U.S. Cl. 426—2 5 Claims

1. An animal feed composition polylysine consisting essentially of a complete compound feed or supplemental feed together with polylysine in which at least some of the amino groups of the polylysine have been grafted with polymethionine and in which the ratio of methionine to lysine is less than 2, the resultant polymethionylpolylysine having a molecular weight of 20,000 to 1,000,000 daltons, and the amount of said polymethionylpolylysine being sufficient to provide a diet containing substantially all of the animal's dietary requirements of lysine and methionine.

4,701,329

CALCIUM-FORTIFIED MILK

Catherine E. Nelson, Syracuse; Dennis E. Crowley, Adams, both of N.Y., and Wayne M. Weatherford, Spring, Tex., assignors to Borden, Inc., Columbus, Ohio

Filed Feb. 10, 1986, Ser. No. 827,892
Int. Cl.[4] A23C *9/154, 9/158*
U.S. Cl. 426—74 39 Claims

1. A calcium-fortified milk product providing about 500 mg–1000 mg of calcium per 8 ounce serving comprising liquid milk containing not less than 1% butterfat, an added edible, bland, water-insoluble calcium compound in finely divided form distributed therein, and 0.01%–0.06% of carrageenan gum and 0.01%–0.06% of guar gum each in hydrated form and uniformly distributed throughout the liquid milk as stabilizers, said percentages being by weight based on the weight of the fluid milk, the amounts and proportions of said gums being sufficient to render said calcium-fortified milk substantially suspension-stable.

4,701,330

PRESERVATION OF THE GREEN COLOR OF BLANCHED VEGETABLES

Ann M. Rogers, Ramsey, N.J.; Nabil A. El-Hag, Putnam Valley, and Soliman Y. K. Shenouda, Tarrytown, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 12, 1986, Ser. No. 862,065
Int. Cl.[4] A23L *1/212*
U.S. Cl. 426—270 3 Claims

1. A process for retaining the green color of blanched vegetables stored under refrigerated conditions comprising the steps of:

(a) blanching green vegetables at a temperature of from 150° F. to 212° F.;

(b) exposing the blanched green vegetables to a vacuum at a pressure of from 19 inch Hg. to 29 inch Hg. for a period of time sufficient to remove the entire surface micro air layer of said blanched green vegetables;

(c) completely submerging the blanched green vegetables while under vacuum into alkaline de-aerated water having a pH ranging from 7.2 to 9.5 for a time ranging from 5 to 30 minutes; and

(d) draining the vegetables and storing under refrigerated temperature of from 32° F. to 45° F. for a period of time up to 21 days.

4,701,331

NON-DUSTY BLENDS OF MEALS OR FLOURS WITH ACTIVE PRINCIPLES FOR USE IN FODDER PRODUCTION

Ernst B. Grabitz, Casatenovo, Italy, assignor to DOX-AL Italia SpA, Correzzana, Italy

Filed Feb. 21, 1986, Ser. No. 831,613
Claims priority, application Italy, Apr. 12, 1985, 29315 A/85
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—302 7 Claims

1. A livestock feed having improved antistatic properties, comprising:

(a) a carrier feed meal or feed flour;

(b) an antibacterial compound, said compound's granulometric characteristic bieng 80 mesh for 90 to 95% by weight of the compound, said compound comprising 2 to 80% of the feed;

(c) a non-ionic surfactant physiologically compatible with livestock feed said surfactant present in an amount betwen 0.5 and 8% by weight of the feed; and

(d) a liquid selected from the group consisting of propylene glycol, glycerol, and polyethylene glycol in an amount between 0.5 and 10% by weight of the feed.

4,701,332

PROCESS FOR PREPARING A TOFU CHEESE AND PRODUCT

Robert J. Pirello, 932 Pine St., Philadelphia, Pa. 19107

Filed Nov. 15, 1985, Ser. No. 798,566
Int. Cl.[4] A23C *20/02*
U.S. Cl. 426—302 14 Claims

1. A process for the preparation of a creamy tofu cheese from a tofu brick comprising coating said brick with a mellow white miso coating, aging said coated brick for a time sufficient to produce a smooth and compact texture which is relatively free from pores and syneresis, scraping said miso from said brick, soaking said brick in fresh water until the salt content of said brick remains substantially unchanged, and whipping said brick until a creamy texture is achieved, whereby a soft creamy water separation resistance tofu cheese is formed.

4,701,333

PROCESS FOR EXTRACTING ROASTED AND GROUND COFFEE

Geoffrey Margolis, Bussigny; Alain Mercier, Jouxtens-Mezery, and Klaus Schlecht, Orbe, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Aug. 28, 1981, Ser. No. 297,324
Int. Cl.[4] A23F *5/26*
U.S. Cl. 426—432 8 Claims

1. Process for extracting roasted and ground coffee comprising wetting, in the absence of oxygen, roasted and ground coffee having an average particle size not exceeding 2.0 mm, with at least twice its weight of an aqueous liquid, transferring the wetted coffee, out of contact with oxygen, to an extractor and extracting the coffee with an aqueous liquid at a temperature of at least 100° C.

4,701,334

METHOD OF SELECTIVELY OPERATING A COOKING APPARATUS WITH CIRCULATING HEATED AIR OR WATER VAPOR

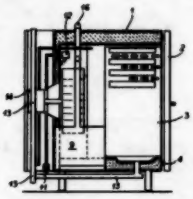
Wilfried Durth, Burbach-Wahlbach, Fed. Rep. of Germany, assignor to Buderus Aktiengesellschaft, Wetzlar, Fed. Rep. of Germany

Filed Nov. 21, 1985, Ser. No. 800,470
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443477
Int. Cl.[4] A23L *1/01;* A47J *37/00*
U.S. Cl. 426—510 5 Claims

1. In a method of cooking a foodstuff by selectively operating a cooking apparatus with circulating heated air or circulat-

ing water vapor, at least one circulating blower, and wall defining a cooking space, the improvement which comprises the steps of:

for changing an operating mode from circulating heated air to circulating water vapor in the cooking of the foodstuff,



spraying a cooking space wall with a sufficient volume of cold water for a period of time until the temperature in the cooking space has been lowered to approximately 100° C., then terminating the spraying of cold water; and

thereafter admitting steam to said space to effect water vapor cooking of the foodstuff.

4,701,335

BUTTER-LIKE CONCENTRATE

Tamme Doornbos, Rotterdam; Arnoldus van der Heijden, 's-Gravenzande; Johannes W. van der Kamp, Nieuwerkerk a/d IJssel, all of Netherlands, and Johannes F. de Rooij, Sellindge, United Kingdom, assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 768,305, Aug. 22, 1985, abandoned. This application Feb. 21, 1986, Ser. No. 832,108

Claims priority, application United Kingdom, Aug. 24, 1984, 8421535; Netherlands, Feb. 7, 1985, 8500336

Int. Cl.[4] A21D *10/00*; A23L *1/226*

U.S. Cl. 426—533 **7 Claims**

1. A butter-like concentrate prepared by a process comprising heating a mixture between 70° and 140° C. for at least 10 minutes, said mixture comprising:

25–98% (w/w) of an oil or fat containing at least 25% butterfat; and

2–74% of milk protein and a saccharide chosen from monosaccharide, disaccharide, and mixtures thereof,

the weight ratio of protein to saccharide ranging from 3:1 to 1:3;

said concentrate, when incorporated with bakery ingredients to produce bakery products, will as a result of baking release a butter flavor.

4,701,336

CIDER VINEGAR FLAVOR

Billy J. Softly, and An S. Huang, both of Danbury, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 327,845, Dec. 7, 1981, abandoned. This application Jul. 13, 1983, Ser. No. 513,265

Int. Cl.[4] A23L *1/221, 1/226*

U.S. Cl. 426—538 **4 Claims**

1. A composition which simulates the flavor and aroma of cider vinegar consisting of diethyl succinate, beta-phenethyl formate and beta-phenethyl alcohol at relative weight ratios of within the ranges of 15–50:1–4:0.5–2.0.

4,701,337

CHOCOLATE PRODUCT CONTAINING DIPEPTIDE-COCOA BUTTER COMPOSITION

John R. Frost, Tarrytown; Nancy J. Sarich, Putnam Valley, both of N.Y.; Timothy W. Schenz, Haworth, and Alfred C. Glatz, Summit, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 755,231, Jul. 15, 1985, abandoned, which is a continuation of Ser. No. 531,525, Sep. 12, 1983, Pat. No. 4,536,410. This application Sep. 30, 1985, Ser. No. 782,237

Int. Cl.[4] A23G *1/00*

U.S. Cl. 426—548 **15 Claims**

1. A method of producing a chocolate which does not melt at body/hand temperature comprising the steps of:

(a) adding a hydrated, crystalline dipeptide sweetener to melted cocoa butter and heating to a temperature of from about 36° C. to about 195° C. for a time sufficient to form a gel which is thermally irreversible said sweetener containing water of crystallization wherein said hydrated sweetener comprises between about 0.02 and about 1.0 parts water per part dipeptide and wherein said gel contains by weight between about 0.5 and about 15 grams hydrated crystalline dipeptide sweetener per 100 grams of cocoa butter;

(b) cooling said gel of melted cocoa butter and dipeptide sweetener to a temperature below 20° C.;

(c) mixing the product of step (b) with lecithin, sugar, milk powder and chocolate liquor;

(d) refining the mixture of step (c) by passing same through rolls to produce particles between about 35 to about 50 microns in size;

(e) conching the mixture until it becomes a fluid;

(f) tempering the resulting mixture for a time sufficient for crystal formation; and

(g) pouring the resulting mixture into molds and storing until the mixture is set.

14. An improved chocolate which does not melt at hand/body temperature wherein the improvement comprises replacing the cocoa butter fraction of said chocolate with a dipeptide sweetener-cocoa butter thermally irreversible gel composition comprising a hydrated, crystalline, dipeptide sweetener containing water of crystallization wherein said hydrated dipeptide sweetener comprises between about 0.02 and about 1.0 parts water per part dipeptide sweetener and wherein the composition contains by weight between 0.5 and about 15 grams hydrated dipeptide sweetener per 100 grams of cocoa butter.

4,701,338

SALAD DRESSING AND METHOD OF MAKING

Maria Del Vento, 407 Netherwood Crescent, Altamonte Springs, Fla. 32714

Filed Mar. 10, 1986, Ser. No. 837,772

Int. Cl.[4] A23L *1/24*

U.S. Cl. 426—602 **2 Claims**

1. A process for preparing a food product of the type used for dressings on salads, vegetables and the like, wherein the ingredients are combined, using a chemically nonreactive container, by a process including the steps of:

using a stainless steel or other chemically nonreactive container having a mixing shaft, a propellant plate, and a top closure means, combine the following ingredients by:

(a) slowly agitating 64.0 fluid ounces of wine vinegar in a partially closed container, while heating to a temperature in the range of 95° to 100° F.;

(b) incorporating 6.0 ounces dry weight of sugar into the vinegar, using slow agitation for four to five minutes, while maintaining the temperature of the mixture in the range of 95° to 100° F.;

(c) incorporating 256.0 fluid ounces of bleached and deodorized vegetable oil, by agitation into the heated vinegar mixture to form a primary oil and vinegar mixture;

(d) reducing the temperature of said primary oil and vinegar mixture to the range of 80° to 85° F.;
(e) incorporating 0.5 ounces dry weight of whole thyme by slow agitation for four to five minutes, followed by allowing said primary oil and vinegar mixture to set at rest for 20 to 25 minutes while maintaining the temperature in the range of 80° to 85° F. to extract the flavor from the fiber cells of the thyme;
(f) grinding 2.0 ounces dry weight of whole dried basil, followed by incorporating the ground basil by slow agitation into said primary oil and vinegar mixture for five to eight minutes while maintaining the temperature in the range of 80° to 85° F.;
(g) reducing the temperature of said primary oil and vinegar mixture to ambient room temperature;
(h) removing 200 ml of said primary oil and vinegar mixture obtained from steps (a) through (g) to a sterile glass container and reheating to a temperature in the range of 80° to 85° F. before adding 2.0 ounced dry weight of ground oregano to the reheated 200 ml of oil and vinegar;
(i) allowing the oil, vinegar, and oregano to set at rest without additional application of heat, for a period of 20 to 25 minutes to extract the flavor of the oregano;
(j) incorporating said 200 ml mixture of oil, vinegar, and oregano under agitation for one to two minutes into said primary oil and vinegar mixture;
(k) removing a second 200 ml portion of the oil and vinegar mixture produced by steps (a) through (j) and, after heating said second portion to a temperature in the range of 80° to 85° F., dissolving 8.0 ounces dry weight of table salt and 6.0 ounces dry weight of monosodium glutamate based flavor enhancer therein, under agitation for two to three minutes in a separate blender;
(l) forming a mixture of garlic and cheese by mixing and grinding, in a separate blender, for two to five minutes, 6.0 ounces dry weight of granulated garlic and 12.0 ounces dry weight of parmesan cheese;
(m) incorporating a preservative, in the amount of 9.125%, by dry weight of said garlic and cheese mixture by separately blending as in Step (l);
(n) simultaneously incorporating the garlic, cheese and preservative mixture and agitating for four to six minutes while maintaining a temperature in the range of 80° to 85° F.;
(o) closing the vessel and allowing the completed mixture to cool to ambient temperature;
(p) bottling and sealing the finished product according to conventional methods.

4,701,339

METHOD FOR DISSOLVING SQUID MEMBRANES

Jean-Louis Leuba, Boussens; Inge Meyer, La Tour-de-Peilz, both of Switzerland, and Else M. Andersen, Bjuv, Sweden, assignors to Nestec S.A., Vevey, Switzerland

Filed Feb. 20, 1986, Ser. No. 832,125
Claims priority, application Switzerland, Mar. 4, 1985, 962/85
Int. Cl.[4] A23L *1/333, 1/325*
U.S. Cl. 426—643 **20 Claims**

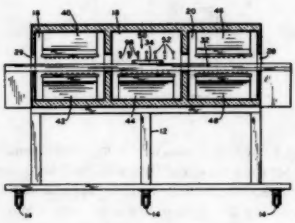
1. A process for treating edible parts of squid, so that squid membranes dissolve upon cooking in water, comprising preparing a dispersion of 1 part squid liver to from 1 to 35 parts of brine, which contains at least 0.2% by weight of NaCl, to obtain a fatty phase and an aqueous phase, separating the aqueous phase from the fatty phase, diluting the aqueous phase with 1 to 15 parts by weight of water per part by weight of the aqueous phase, adjusting the aqueous phase to obtain a NaCl content of at least 0.2% by weight and a pH between 3 and 8 and immersing the squid in t he adjusted aqueous phase for from 30 minutes to 10 hours at 1° C. to 30° C.

4,701,340

IMPINGEMENT AND STEAM OVEN APPARATUS FOR PREPARING FOOD PRODUCTS

Ronald E. Bratton; Richard W. Gigandet; Mitchell C. Henke; Daniel S. Kaminski, and Michelle A. Wibel, all of Fort Wayne, Ind., assignors to Lincoln Foodservice Products, Inc., Fort Wayne, Ind.

Filed Dec. 9, 1985, Ser. No. 806,701
Int. Cl.[4] A21B *1/00;* **A23L** *1/01*
U.S. Cl. 426—511 **37 Claims**



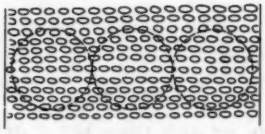
26. A method for cooking a food product comprising the steps of:
supporting a food product in an open container;
forming a plurality of columnated jets of heated air;
directing said columnated jets of heated air onto an outside surface of said container so that the jets of heated air impinge against discrete points of said outside surface of said container;
forming a plurality of columnated jets of steam;
directing said columnated steam jets against a surface of said food product so that said steam jets impinge against discrete points of said food product surface; and
moving said food product relative to said air jets and steam jets.

4,701,341

METHOD FOR COATING GRANULES, PILLS, AND TABLETS

Curt H. Appelgren, Kungsbacka, Sweden, assignor to Lejus Medical Aktiebolag, Molndal, Sweden

Filed Mar. 20, 1986, Ser. No. 841,612
Claims priority, application Sweden, Mar. 20, 1985, 8501365
Int. Cl.[4] A61K *9/00;* **B05D** *1/02, 7/00*
U.S. Cl. 427—3 **4 Claims**



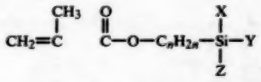
1. A process for coating granules, pills or tablets with a coating agent dissolved in a solvent comprising:
(a) moving the articles to be coated perpendicularly past a series of spray nozzles; and
(b) issuing a full conical spray of the coating agent dissolved in the solvent from the spraying nozzles in a manner such that overlapping of adjacent spray patterns is avoided.

4,701,342
NEGATIVE RESIST WITH OXYGEN PLASMA RESISTANCE

Anthony E. Novembre, Union, and Elsa Reichmanis, Westfield, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 6, 1986, Ser. No. 837,018
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—38 **8 Claims**

1. A process for fabricating an article comprising the steps of forming a negative-acting radiation-sensitive region on a substrate, patterning at least a portion of said region, and further processing said substrate CHARACTERIZED IN THAT said region comprises a composition formed by a polymerization process employing (1) at least one material represented by the formula:



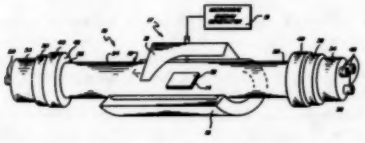
where n=1, 2 or 3 and x, y, and z are individual methyl or ethyl, and (2) at least one material represented by the formula:

where A is a naphthyl or phenyl moiety, and E is chosen from the group consisting of chloro, chloromethyl, dichloromethyl, and bromomethyl.

4,701,343
METHOD OF DEPOSITING THIN FILMS USING MICROWAVE ENERGY

Stanford R. Ovshinsky, Bloomfield Hills; David D. Allred, Troy; Lee Walter, Bloomfield Hills, and Stephen J. Hudgens, Southfield, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 854,247, Apr. 21, 1986, Pat. No. 4,664,937, which is a continuation of Ser. No. 725,616, Apr. 22, 1985, Pat. No. 4,615,905, which is a continuation of Ser. No. 423,424, Sep. 24, 1982, Pat. No. 4,517,223. This application Aug. 13, 1986, Ser. No. 896,049
The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.
Int. Cl.[4] C23C *11/02*
U.S. Cl. 427—39 **17 Claims**

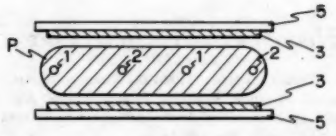


1. A process for depositing thin, non-single crystal films onto a substrate, comprising:
providing a source of microwave energy;
providing an enclosed reaction vessel;
providing a substrate in said reaction vessel;
coupling said microwave energy into said substantially enclosed reaction vessel containing said substrate;
introducing into said vessel at least one reaction gas to form a glow discharge plasma within said vessel and to form reaction gas species from said reaction gas; and
evacuating said reaction vessel to a deposition pressure of 0.1 torr or less so as to provide for the deposition of a film from said reaction gas species onto said substrate at high deposition rates with high reaction gas conversion efficiencies.

4,701,344
FILM FORMING PROCESS

Yoshihisa Tawada, and Kazunori Tsuge, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP85/00064, § 371 Date Oct. 15, 1985, § 102(e) Date Oct. 15, 1985, PCT Pub. No. WO85/03803, PCT Pub. Date Aug. 29, 1985
PCT Filed Feb. 15, 1985, Ser. No. 800,638
Claims priority, application Japan, Feb. 17, 1984, 59-29084
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—39 **7 Claims**



1. An improvement in a process for forming a film of amorphous semi-conductor by glow discharge decomposition, such improvement comprising the step of arranging at least one planar substrate in a position approximately parallel to at least one row of electrode pairs, each said row consisting of a plurality of high frequency electrodes arranged in a single line, said rows of electrode pairs being parallel to each other and being arranged so that electric discharge occurs only between electrodes in the same row, but no electric discharge occurs between electrodes from different rows and the substrate does not pass through the line of electric discharge between electrodes.

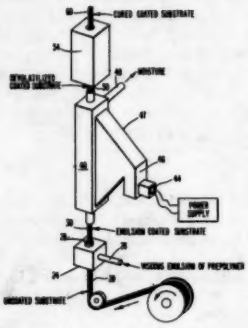
4,701,345
PROCESS FOR APPLYING POLYMERIC COATINGS, AND RESULTING COATED ARTICLES

James L. Giatras, Spring City, Pa.; Warren G. Mang, Haddonfield, N.J.; Charles P. Marino, Philadelphia; Michael C. Needling, Audubon, both of Pa., and George F. Pezdirtz, Lanham, Md., assignors to Markel Corporation, Norristown, Pa.

Filed Mar. 11, 1986, Ser. No. 838,593
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—45.1 **4 Claims**

1. A process for applying a coating of a polymeric material to an inert solid substrate, said process comprising the steps of:
(a) Preparing an emulsion of the polymerizable material;
(b) Adding to said emulsion a thickening agent consisting of a finely-divided, solid, inert, hydrophilic inorganic oxide material in an amount sufficient to thicken said emulsion to a viscosity in the range of from about 35,000 to about 500,000 centipoises;
(c) Applying a coating of the thickened emulsion to said substrate;
(d) Subjecting the emulsion coating on said substrate to microwave energy of a frequency sufficient to excite the molecules of the non-polymerizable emulsion phase and at

a microwave power density and for a period of time sufficient to substantially devolatilize said emulsion coating; and

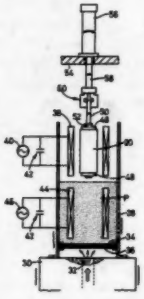


(e) Subjecting the devolatilized emulsion coating to thermal energy to complete polymerization.

4,701,346
METHOD FOR COATING METAL PART WITH SYNTHETIC RESIN

Shigenori Tamaki, Toyota; Hiroyuki Machizuki, Aichi; Nobuo Kobayashi, Toyota; Takahiro Iwase, Anjyo, and Naofumi Masuda, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 5, 1986, Ser. No. 893,143
Int. Cl.[4] B05D *1/24, 3/14*
U.S. Cl. 427—46 **8 Claims**



1. A method of applying a synthetic resin layer to an outer surface of a metal part, comprising the steps of:

positioning said metal part within a powdered mass of a thermally fusible synthetic resin;

induction-heating said metal part within said powdered mass to temperature between a melting point and a thermal decomposition point of said synthetic resin, thereby melting a portion of said powdered mass surrounding said outer surface of the heated metal part and coating the molten portion of said powdered mass on said outer surface of said heated metal part as said synthetic resin layer;

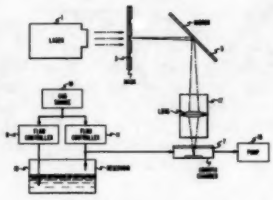
pushing down said metal part by a predetermined distance within said powdered mass, at least once and at a point of time between an end of said step of positioning said metal part within said powdered mass and an end of said step of induction-heating said metal part; and

removing said metal part, coated with said synthetic resin layer, from said powdered mass.

4,701,347
METHOD FOR GROWING PATTERNED METAL LAYERS

Gregg S. Higashi, Basking Ridge, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 18, 1986, Ser. No. 853,676
Int. Cl.[4] B05D *3/06*
U.S. Cl. 437—246 **11 Claims**



1. A method of semiconductor device fabrication including the step of forming patterned metal on a surface, said forming step comprising the steps of

forming an adsorbed layer of metal containing molecules on said surface from a gaseous atmosphere containing said molecules, said molecules having a partial pressure less than one atmosphere and said surface heated to an elevated temperature;

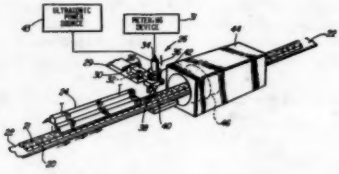
imaging the desired pattern on said substrate by radiation thereby photolytically decomposing said molecules and leaving metal on said surface; and

catalytically growing an additional quantity of the same metal from said atmosphere on the photolytically deposited metal.

4,701,348
METHOD OF COATING THE THREADS OF A FASTENER

Glen F. Neville, Howell, Mich., assignor to Glenco Manufacturing, Inc., Brighton, Mich.

Filed Nov. 20, 1986, Ser. No. 933,006
Int. Cl.[4] B05D *3/12*
U.S. Cl. 427—57 **12 Claims**



1. A method of coating the threads of a fastener, comprising the following steps:

(a) forming a fluid suspension of said coating material in the form of a fine powder in a fluid solvent;

(b) heating said fastener threads;

(c) forming a drop of said coating material fluid suspension on the tip of an ultrasonic head and bringing said head into proximity with said heated fastener threads;

(d) vibrating said head in the ultrasonic range, exploding said drop and coating said threads with a fine mist of said coating material fluid suspension; and

(e) further heating said fastener threads to vaporize said solvent, forming a dry coating on said threads.

4,701,349

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND METHOD OF PRODUCING THE SAME

Mitsumasa Koyanagi, and Hiroko Kaneko, both of Higashimurayama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 9, 1985, Ser. No. 806,342

Claims priority, application Japan, Dec. 10, 1984, 59-259144

Int. Cl.[4] H01L *21/285*

U.S. Cl. 427—228 **15 Claims**

1. A method of producing a semiconductor integrated circuit device comprising the steps of:

exposing a part of a surface of silicon on a semiconductor substrate in such a manner that the surface shape of the exposed silicon region is defined by an insulating film;

depositing a refractory metal at least on said exposed silicon region;

forming a silicide layer of said refractory metal on said exposed silicon region, said silicide layer being formed by first annealing below 600° C. which lets said silicon react with said refractory metal, and having a relatively high resistance;

removing said refractory metal other than the one that has contributed to said silicide layer, whereby said silicide layer remains unremoved; and

effecting a second annealing, in order to change said silicide layer having a relatively high resistance to a silicide layer having a low resistance, said second annealing including an annealing above 900° C. in a nitrogen atmosphere.

4,701,350

PROCESS FOR ELECTROLESS METAL DEPOSITION

Deborah J. Lindsay, Princeton, N.J., assignor to Surface Technology, Inc., Princeton, N.J.

Division of Ser. No. 578,829, Feb. 10, 1984, which is a continuation of Ser. No. 310,785, Oct. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 204,495, Nov. 6, 1980, abandoned. This application Aug. 22, 1986, Ser. No. 899,095

Int. Cl.[4] B44D *1/14*

U.S. Cl. 427—97 **26 Claims**

1. A process for the metallization of a substrate by electroless plating or chemical plating comprising:

a. contacting said substrate with a composition comprising and adsorption modifier, said modifier being a polyelectrolyte, thereby providing a path for the increased catalytic site density,

b. rinsing said substrate to remove excess adsorption modifier, and thereafter without the use of a sensitizing step

c. contacting said treated substrate with a noble catalytic metal composition, comprising a noble catalytic metal capable of electroless plating initiation, which directly or serving as a precursor leads to the catalytic sites which are capable of electroless plating initiation and wherein said noble catalytic metal may be either in the elemental state, an alloy, a compound, or a soluble complex, and mixtures thereof, and

d. contacting said substrate with a compatible electroless plating bath to deposit a metallic layer.

4,701,351

SEEDING PROCESS FOR ELECTROLESS METAL DEPOSITION

Robert L. Jackson, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,976

Int. Cl.[4] B05D *5/12*; **G03C** *5/00*

U.S. Cl. 427—98 **9 Claims**

1. A process for depositing and tightly binding noble metal seeds onto a substrate, said process being characterized by the steps of:

(1) coating the substrate with a thin layer less than 1 micron thick of a polyamine, polyacid or salt of a polyacid polymer which complexes with a noble metal compound, and

(2) contacting said layer of polymer with a noble metal compound which forms a complex with the layer of polymer.

4,701,352

SURFACE PREPARATION OF CERAMIC SUBSTRATES FOR METALLIZATION

Michael A. DeLuca, Holbrook, and John F. McCormack, Roslyn Heights, both of N.Y., assignors to Kollmorgen Corporation, Simsbury, Conn.

Continuation-in-part of Ser. No. 607,874, May 10, 1984, Pat. No. 4,604,299, and Ser. No. 611,193, May 21, 1984, Pat. No. 4,574,094, which is a continuation-in-part of Ser. No. 502,748, Jun. 9, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 679,835

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—98 **19 Claims**

1. In a process for metallizing a surface of a ceramic substrate which includes adhesion promoting the surface with an alkali metal composition containing one or more alkali metal compounds and subsequently depositing metal on the adhesion promoted surface, the improvement which comprises:

providing said alkali metal compound(s) in the form of one or more discrete solid shapes sized 25 mg to about 500 mg

contacting the ceramic surface with a quantity of the solid shapes which when molten will spread across and uniformly wet the ceramic surface;

heating the alkali metal composition and the substrate for a time period and at or above a temperature at which the alkali metal composition becomes molten in situ on the ceramic surface, spreading out and uniformly wetting the ceramic surface and which is sufficient to adhesion promote the ceramic surface, and render it receptive to subsequent adherent metal deposition; and

in a later step, plating an adherent metal layer on the treated ceramic surface or selected parts thereof.

17. A process for producing a printed circuit on a surface of a ceramic substrate comprising:

(a) contacting the ceramic surface with an alkali metal composition comprised of an alkali metal compound in the form of a multiplicity of discrete solid shapes sized 25 mg to about 500 mg, each shape having a preselected mass, said shapes being present in a quantity which when molten will spread across and uniformly wet the ceramic surface;

(b) heating the alkali metal composition and the substrate for a time period and at or above a temperature at which the alkali metal composition becomes molten in situ on the ceramic surface, spreading out and uniformly wetting the ceramic surface, and which is sufficient to adhesion promote the ceramic surface and render it receptive to subsequent adherent metal deposition

(c) treating the ceramic surface to activate it for electroless metal deposition;

(d) depositing metal onto the activated surface;
(e) removing portions of the deposited metal to produce a metal printed circuit conductor pattern adhering to the surface of the ceramic substrate.

4,701,353

PROCESS FOR THE PREPARATION OF GRANULES

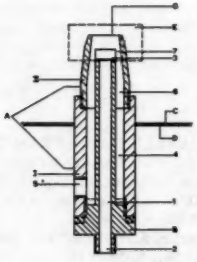
Stanislaus M. P. Mutsers, Geleen, and Gerardus S. P. M. Craenen, Susteren, both of Netherlands, assignors to Unie van Kunstmestfabrieken B.V., Utrecht, Netherlands

Filed Aug. 21, 1984, Ser. No. 643,024

Claims priority, application Netherlands, Aug. 27, 1983, 8303000

Int. Cl.⁴ B05D *1/02*

U.S. Cl. 427—213 **7 Claims**



1. A process for the preparation of solid granules from a liquid material which process comprises the steps of:
(1) forming and maintaining, in a vessel and above a feeding device therein, a fluidized bed of solid particulate nuclei by upwardly flowing a first relatively low velocity fluidizing gas stream through said bed, said feeding device comprising:
(a) a first central conduit for delivering an upward flow of starting liquid material into the vessel from the exit of said first conduit in the form of an initially virtually closed conical film, with a vertex angle of 50°–110°, and with an internal turbulence such that the Weber number, expressed as:

$$We\delta = \rho_l (U_l)^2 \delta / \sigma_l,$$

is greater than 2000, and
where:
ρ_l = the density of the liquid material, in kg/m^3,
U_l = the potential velocity of the liquid material, in m/sec.,
σ_l = the surface tension of the liquid material, in N/m,
δ = the film thickness upon exit from the central channel, in m,
(b) said first central conduit also having means for imparting a horizontal velocity component to said starting liquid prior to its exit, and
(c) a second concentric conduit annularly disposed about said first conduit for delivering an upward flow of a second gas stream into the vessel from the exit thereof,
(2) introducing said starting liquid through said first central conduit to form said vertually closed conical film with said vertex angle and said Weber number, with a thrust exceeding the thrust of said second gas stream and having a horizontal velocity component,
(3) introducing, through said concentric annular conduit said second gas stream in a predominantly vertical direction so that the second gas stream is made to hit the conical film at an angle of 30°–80° and at an initially higher velocity, relative to the velocity of said first gas stream, which second gas velocity is such that the ratio:

$$\rho_{gas}[U_{gas}]^2/\sigma_l$$

where:
ρ_{gas} = the density of the gas, in kg/m^3
U_{gas} = the potential velocity of the gas, in m/sec., and
σ_l = the surface tension of the liquid material, in N/m, is from 5×10^5 to 50×10^5 m^{-1},
thereby forming a dilute zone of solid nuclei above the exit of said feeding device, whereby
(a) said second gas stream impacts said virtually closed conical film to nebulize the same into very fine liquid droplets, to form a droplet loaded gas stream,
(b) said droplet loaded gas stream aspirates a portion of the nuclei from said fluidized bed into said dilute zone,
(c) said aspirated solid particulate nuclei thus contact said very fine liquid droplets to moisten said nuclei, and
(d) allowing the liquid material thereby taken up by the nuclei to soldify thereon causing the solid nuclei to grow in size, and
(4) thereafter removing the thus-obtained granules from said vessel.

4,701,354

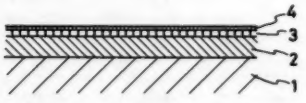
PROCESS FOR SURFACE TREATMENT OF METAL MATERIALS

Yoichi Kitamura; Hisashi Hotta, both of Yokohama, and Toshimasa Kodaira, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Nov. 20, 1985, Ser. No. 800,135

Int. Cl.⁴ C23C *16/00*

U.S. Cl. 427—255.6 **8 Claims**



1. A process for surface treatment of metal materials, which comprises applying a hydroxymethyl substituted phenol in gaseous phase to the surface of a metal material maintained at a high temperature.

8. The process of claim 1 wherein the metal material is a tin-free steel having a chromium-containing coating layer composed of metallic chromium, non-metallic chromium or a mixture thereof on at least the surface thereof to which the hydroxymethyl substituted phenol is applied.

4,701,355

METHOD OF ARTIFICIALLY AGEING WOOD

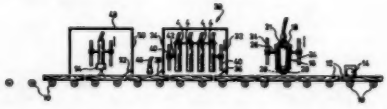
Richard L. Cottingham, Uckfield, England, assignor to Timber Textures (UK) Limited, Tunbridge Wells, England

Filed Mar. 26, 1985, Ser. No. 716,249

Claims priority, application United Kingdom, Mar. 29, 1984, 8408137

Int. Cl.⁴ B05D *3/02*

U.S. Cl. 427—317 **5 Claims**



1. A method of artificially ageing wood comprising the steps of:
establishing a combustion zone,
introducing into the combustion zone a fuel/air mixture,
igniting the fuel/air mixture as it enters the combustion zone,

combusting the fuel/air mixture completely within the combustion zone with the flame being only in the combustion zone to produce hot combustion gases,

leading the hot combustion gases from the combustion zone to an issue zone,

projecting from the issue zone at high speed at least one jet of hot combustion gases against a surface of a length of wood, the surface being made up of wood grain and softer wood therebetween,

moving the length of wood relative to the projected high speed hot combustion gases to subject the whole of the surface of the length of wood to the high speed hot combustion gases to scorch the whole surface of the length of wood and to blow away the scorched softer wood of the surface and to leave the grain of the surface standing out slightly, and

subsequently applying a lacquer to the thus treated surface.

4,701,356

METHOD OF FACING USING HOMOGENEOUS, DUCTILE NICKEL BASED HARDFACING FOILS

Debasis Bose, Randolph; Amitava Datta, Mendham; Nicholas J. DeCristofaro, Chatham, all of N.J., and Claude Henschel, Redwood City, Calif., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 703,017, Feb. 19, 1985, abandoned, which is a division of Ser. No. 515,677, Jul. 21, 1983, Pat. No. 4,515,869, which is a division of Ser. No. 285,883, Jul. 22, 1981, abandoned. This application Nov. 17, 1986, Ser. No. 931,096

The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.

Int. Cl.[4] C23C *4/10*

U.S. Cl. 427—423 **1 Claim**

1. A process for hardfacing a metal substrate comprising the steps of:

a. feeding a continuous filament from a spool to a heating zone, said filament being homogeneous and ductile, composed of metastable material having at least 50 percent glassy structure and having a composition consisting essentaially of 0 to about 22 atom percent cobalt, 0 to about 4 atom percent iron, 7 to about 23.3 atom percent chromium, 0 to about 16 atom percent tungsten, 0 to about 5 atom percent molybdenum, about 2.5 to about 20 atom percent boron, 0 to about 8 atom percent silicon, 0 to about 3.68 atom percent carbon, and 38 to 68 atom percent nickel plus incidental impurities with the proviso that the total of iron, cobalt, nickel, chromium, tungsten and molybdenum ranges from about 70 to 88 atom percent and the total of boron, silicon and carbon ranges from about 12 to 30 atom percent;

b. applying heat to said filament within said heating zone to melt said filament and cause it to become deposited on a work surface in close proximity thereto; and

c. cooling said work surface to cause said deposited filament to form a hard, adherent coating thereon.

4,701,357

HOMOGENEOUS, DUCTILE COBALT BASED HARDFACING FOILS

Debasis Bose, Randolph; Amitava Datta, Mendham; Nicholas J. DeCristofaro, Chatham, all of N.J., and Claude Henschel, Redwood City, Calif., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 703,018, Feb. 19, 1985, Pat. No. 4,650,725, which is a division of Ser. No. 515,679, Jul. 21, 1983, Pat. No. 4,515,868, which is a continuation of Ser. No. 285,882, Jul. 22, 1981, abandoned. This application Nov. 26, 1986, Ser. No. 935,380

The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.

Int. Cl.[4] C23C *4/10*

U.S. Cl. 427—423 **1 Claim**

1. A process for hardfacing a metal substrate comprising the steps of:

a. feeding a continuous filament from a spool to a heating zone, said filament being homogeneous and ductile compound of metastable material having at least 50 percent glassy structure and having a composition consisting essentially of 0 to about 30.9 atom percent nickel, 0 to about 7.3 atom percent iron, 0 to about 26.3 atom percent chromium, 0 to about 1.9 atom percent tungsten, 0 to about 4 atom percent molybdenum, about 8 to about 13 atom percent boron, 1.7 to about 13 atom percent silicon, 0 to about 1.3 atom percent manganese and 0 to 4.5 atom percent carbon and 39.4–70.3 atom percent cobalt and incidental impurities with the proviso that the total of iron, cobalt, nickel, chromium, tungsten and molybdenum ranges from about 70 to 88 atom percent and the total of boron, silicon and carbon ranges from about 12 to 30 atom percent;

b. applying heat to said filament within said heating zone to melt said filament and cause it to become deposited on a work surface in close proximity thereto; and

c. cooling said work surface to cause said deposited filament to form a hard, adherent coating thereon.

4,701,358

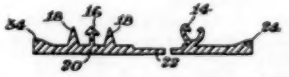
THERMOPLASTIC FILM WITH INTEGRAL CLOSURES AND RECLOSABLE CONTAINER FORMED THEREFROM

Raymond D. Behr, and Larry M. Zieke, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 591,662, Mar. 21, 1984, Pat. No. 4,562,027. This application Jul. 19, 1985, Ser. No. 756,906

Int. Cl.[4] B65D *33/16, 33/24*

U.S. Cl. 428—35 **7 Claims**



1. A film containing integrally extruded reclosable fastener profiles wherein each of the fastener profiles contains a base thicker than said film and is substantially perpendicular to the surface of the film and wherein said film has thickened edges along each of the sides thereof, said thickened edges being thicker than both said base and film and extending from said surface of the film in the same direction as said fastener profiles.

4,701,359
PACKAGING MATERIAL FOR PHOTOSENSITIVE MATERIALS

Mutsuo Akao, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 22, 1986, Ser. No. 821,414
Claims priority, application Japan, Jan. 28, 1985, 60-12663; Feb. 19, 1985, 60-29416
Int. Cl.[4] B27N 5/02
U.S. Cl. 428—35 4 Claims

1. A packaging material for photosensitive materials for photographic purpose being light-shielding and having the following polyethylene polymer layer;

(a) containing 40 to 99% by weight of a low-pressure linear low-density polyethylene (L-LDPE) produced by copolymerization of ethylene and heptene-1 or octene-1 by a liquid phase method, the density of said polyethylene is in the range from 0.870 to 0.925 g/cm^3, and the melt index of said polyethylene is in the range from 1.2 to 10 g/10 minutes,

(b) having a thickness of thicker than 20 μm,

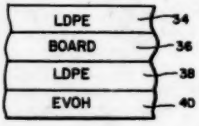
(c) being formed by inflation process, and

(d) having a tear strength in longitudinal direction / a tear strength in lateral direction ratio of more than 0.6.

4,701,360
HEAT SEALABLE BARRIER MATERIAL FOR IMPROVED JUICE PACKAGING (EVOH)

Charles E. Gibbons, and Allan A. Whillock, both of Mobile, Ala., assignors to International Paper Company, New York, N.Y.

Filed May 16, 1986, Ser. No. 864,142
Int. Cl.[4] B65D 15/22; B32B 27/10
U.S. Cl. 428—35 25 Claims



1. A container for liquids containing essential oils and/or flavors, said container constructed from a laminate comprising:

(a) a paperboard substrate;

(b) an outer layer of a heat-sealable low density polyethylene polymer coated on said outer surface of said paperboard substrate;

(c) an inner layer of heat-sealable low density polyethylene polymer coated on said inner surface of said paperboard substrate; and

(d) a liquid contact layer of ethylene vinyl alcohol copolymer heat-sealed with the outside layer of low density polyethylene of the laminate on conventional equipment at temperatures ranging from 250° F.-500° F. extrusion coated on said outer surface of said inner layer of said polyethylene polymer, acting as a barrier to the transport of oxygen and essential oils/flavors therethrough.

4,701,361
TUBULAR FILM WITH TRANSVERSE CLOSURE STRIPS

Donald L. Van Erden, Wildwood, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Nov. 20, 1985, Ser. No. 799,828
Int. Cl.[4] B31B 1/90; B32L 31/20; B65D 33/24
U.S. Cl. 428—36 13 Claims

1. Plastic film especially adapted for making bags with transverse closure strips using a mandrel with a rotary knife, comprising:

a continuously extruded plastic film tube having a longitudinal tube axis;

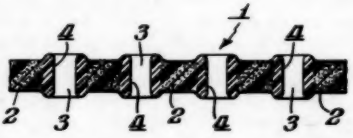
closure strip means having a continuous longitudinal strip axis and said strip means being joined to a surface of said tube and with the strip axis extending generally transversely relative to said tube axis; and

said closure strip means being disposed on said tube surface with respect to said knife when said tube is drawn over said mandrel such that said plastic film tube is convertible into ribbon sheet form with said closure strip means extending as individual closure strips having the longitudinal strip axis still extending across the longitudinal tube axis as existing in the ribbon sheet form, and at longitudinally spaced intervals.

4,701,362
DIELECTRIC MATERIAL IN SHEET FORM

Hirosuke Suzuki, Tokorozawa, and Haruo Imaizumi, Nishi-Asuma, both of Japan, assignors to Junkosha Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1986, Ser. No. 921,122
Claims priority, application Japan, Nov. 6, 1985, 60-170551[U]
Int. Cl.[4] B32B 3/10, 27/32
U.S. Cl. 428—131 2 Claims



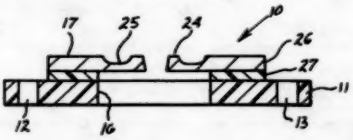
1. A dielectric sheet material of an open cell, continuously porous polymeric material having a plurality of through-holes therethrough, said through-holes having walls, the polymeric material adjacent said walls being substantially solid polymer in the form of highly compression resistant solid pillars.

4,701,363

PROCESS FOR MANUFACTURING BUMPED TAPE FOR TAPE AUTOMATED BONDING AND THE PRODUCT PRODUCED THEREBY

Larry J. Barber, Sunnyvale, Calif., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 27, 1986, Ser. No. 822,580
Int. Cl.[4] B32B *3/10*; B44C *1/22*; C23F *1/02*
U.S. Cl. 428—137 18 Claims



15. A metal tape having at least one interconnect lead pattern defining a plurality of interconnect leads with each of said leads having at least one step therewithin;

said step defining at least one bump in each of said leads at least at one end of said leads;

each said step comprising a web portion connecting each said bump to its lead, said web portion having means for stiffening said web portion comprising a channel beam cross section transversely of said lead.

16. A metal tape as in claim 15 wherein said tape is supported by a flexible nonmetallic substrate bonded to said tape.

4,701,364

TAPE FOR CLEANING MAGNETIC HEAD

Takahito Miyoshi; Akira Kasuga, and Masaaki Fujiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed May 14, 1986, Ser. No. 863,155
Claims priority, application Japan, May 15, 1985, 60-104551
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—141 8 Claims

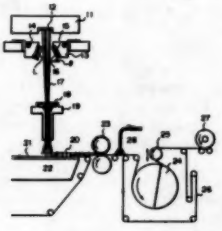
1. A tape for cleaning magnetic heads comprising a support and a cleaning layer coated on at least one surface of said support, which is characterized in that said cleaning layer contains a ferromagnetic metal powder as abrasive, the surface of said cleaning layer is a surface of center line average height of not less than 0.025 μm at cut-off value of 0.08 mm, and said tape has a stiffness of not more than 2.

4,701,365

FORMABLE NONWOVEN SHEET

Hirofumi Iwasaki, Ashiya, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Oct. 22, 1986, Ser. No. 921,681
Claims priority, application Japan, May 28, 1986, 61-121238
Int. Cl.[4] B32B *5/14*
U.S. Cl. 428—171 17 Claims



1. A formable nonwoven sheet composed of filaments of a polyester group and having an apparent density between 0.25 g/cm^3 and 0.80 g/cm^3 and a breaking elongation at 150° C. of 100% or more, characterized in that a relationship between a hooking resistance value Y and a needle piercing resistance value X of said formable nonwoven sheet is satisfied by the following equations (1) or (2);

$$Y/X \geqq 5.00 \quad (1)$$

where $0 < X \leqq 1.2$

$$\frac{Y - 4.5}{X} > 1.25 \quad (2)$$

where $X > 1.2$

4,701,366

MICRO-POROUS SUPERLATTICE MATERIAL HAVING ZEOLITE-LIKE PROPERTIES

Harry W. Deckman, Clinton; Richard B. Stephens, Annandale; J. Thomas Tiedje, Lebanon, and Benjamin Abeles, Annandale, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jul. 1, 1985, Ser. No. 750,140
Int. Cl.[4] B05D *1/32*; B32B *3/26, 3/00*; B01J *29/04*
U.S. Cl. 428—188 20 Claims

1. An article of manufacture comprising a superlattice, said superlattice comprising a multilayered material, wherein said multilayers of the superlattice comprise alternative layers of materials which form slots, said slots being adjacent to layers which extend laterally in different dimensions to a greater lateral extent than those of the slot containing layer.

4,701,367

COATINGS FOR TYPEWRITER TRANSPARENCIES

Shadi L. Malhotra, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1986, Ser. No. 833,684
Int. Cl.[4] B32B *27/08, 3/26, 5/18*; B41J *33/00*
U.S. Cl. 428—216 13 Claims

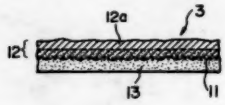
1. A typewriter transparency comprised of a supporting substrate and thereover a coating blend selected from the group consisting of (1) poly(vinyl methyl ether), and poly(styrene); (2) poly(vinyl methyl ether), poly(styrene), and poly(ethyl acrylate); (3) styrene-ethylene-butylene-triblock copolymer, and styrene-butadiene-styrene triblock copolymer; (4) poly(vinyl acetate), and poly(vinyl isobutylether); (5) poly(vinyl methyl ether), poly(vinyl acetate), and poly(ethyl acrylate); (6) poly(hexyl methacrylate), and poly(ethyl acrylate); and (7) poly(cyclohexyl methacrylate), and poly(vinyl acetate).

4,701,368

PAPERMAKER'S PRESSURE BELT FOR EXTENDED NIP PRESSES

Masao Kiuchi, Kamagaya; Yoshiaki Ito, Matsudo; Nobuyuki Ishibashi, and Kazuo Yamada, both of Tokyo, all of Japan, assignors to Ichikawa Woolen Textile Co., Ltd., Japan

Filed Apr. 14, 1986, Ser. No. 851,510
Claims priority, application Japan, Apr. 25, 1985, 60-89732
Int. Cl.[4] B32B 5/02
U.S. Cl. 428—233 8 Claims



1. A papermaker's pressure belt for extended nip presses, comprising: a belt base; a squeezing layer formed of a compressible elastic and porous water absorbent material having a large void volume, and formed over the outer side of the belt base; and an impermeable layer impermeable to oil, formed over the inner side of the belt base.

4,701,369

OPAQUE POLYMER FILM LAMINATE HAVING AN ABSORBENT SURFACE

Gary L. Duncan, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 23, 1986, Ser. No. 854,963
Int. Cl.[4] B32B 3/26, 7/00
U.S. Cl. 428—313.9 31 Claims

1. An oriented, opaque polymer film laminate which comprises:

(a) a non-absorbent thermoplastic polymer core layer having an upper major surface and a lower major surface; and,

(b) a liquid-absorbent, opaque surface layer adherently applied to the upper major surface of the core layer and, optionally, to the lower major surface of the core layer, said surface layer comprising a thermoplastic matrix polymer containing numerous opaquing voids, said voids containing one or more void-intiating particles derives from a material which is phase distinct from, and incompatible with, the matrix material, there being present in said surface layer filler particles having a particle size from about 1 to about 15 microns as measured along the greatest dimension, said particles increasing the absorbency of surface layer(s).

4,701,370

FOAMED, OPAQUE, ORIENTED POLYMERIC FILM STRUCTURE AND PROCESS FOR ITS MANUFACTURE

Hee C. P. Park, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 11, 1986, Ser. No. 895,409
Int. Cl.[4] B32B 3/26, 7/00
U.S. Cl. 428—314.4 27 Claims

1. A foamed, opaque, oriented polymeric film laminate which comprises:

(a) a thermoplastic polymer film containing a quantity of voids sufficient to render said film opaque, a substantial number of the voids containing at least one void-initiating particle which is phase distinct and incompatible with the polymer constituting the film, the void space occupied by the particle being substantially less than the volume of the void, with one generally cross-sectional dimension of the particle approximating a corresponding cross-sectional dimension of the void; and,

(b) an optional void-free thermoplastic polymer skin layer adherently applied to at least one surface of polymer film (a), there being present in polymer film (a) and/or in optional skin layer (b) a quantity of vacant cells, the total volume of voids and cells being sufficient to substantially reduce the density of the entire polymeric film structure.

4,701,371

MAGNETIC RECORDING MEDIUM

Shigeo Aoyama, Kyoto, and Yoshinori Yamamoto, Takatsuki, both of Japan, assignors to Hitachi Maxwell, Ltd., Osaka, Japan

Filed Jun. 26, 1986, Ser. No. 878,782
Claims priority, application Japan, Jun. 26, 1985, 59-140079
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—323 8 Claims

1. A magnetic recording medium which comprises a base film, a magnetic layer provided on one surface of the base film and a back coat layer provided on the other surface of the base film, said back coat layer comprising a resinous binder and non-magnetic oxide particles, characterized in that the non-magnetic oxide particles are of a complex oxide of at least one member chosen from the group consisting of mullite, aluminum titanate and cordierite and have an average particle size of about 0.02 to 0.1 micron and the amount of the non-magnetic oxide particles in the back coat layer is from about 20 to 80 % by weight based on the combined weight of the resinous binder and the non-magnetic oxide particles.

4,701,372

MAGNETIC RECORDING MEDIUM

Takashi Akiyama; Yasunari Hotta, and Naonobu Oda, all of Shiga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Sep. 9, 1986, Ser. No. 905,219
Claims priority, application Japan, Sep. 18, 1985, 60-207139; Sep. 20, 1985, 60-209676
Int. Cl.[4] G11B 5/68
U.S. Cl. 428—323 4 Claims

1. A magnetic recording medium which comprises applying a magnetic layer containing (A) magnetic fine particles of plate-like hexagonal ferrite having a particle size of 0.3 μm or less and an easy axis for magnetization in the direction vertical to the flat plate surface, (B) a polyurethane resin having a metal sulfonate group of 20 to 500 equivalents/10^6 g of the polymer and (C) one or more members selected from the esters of C_{10}–C_{18} fatty acids with alcohols having not more than 15 carbon atoms, the ratio of (C) to (A) being 0.1 to 20 wt. %, to a non-magnetic substrate.

4,701,373

DIFFICULTLY FLAMMABLE VENEERED OR COATED EXTRUDED BOARDS

Fritz-Reichard Fuchs, Reutlingen, and Horst Staendeke, Lohmar, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 667,580, Nov. 2, 1984, abandoned. This application Oct. 6, 1986, Ser. No. 915,493
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340080; May 5, 1984, 3416662
Int. Cl.[4] C08K 9/10; C32B 21/02, 21/14, 23/16
U.S. Cl. 428—326 7 Claims

1. Difficulty flammable coated chip boards veneered with wood or a laminate consisting of

(a) a chip board prepared by extrusion from wooden chips and/or woody fibrous material, respectively, and containing about 5 to 50 weight %, based on the wooden chips and/or woody fibrous material of a flame-retarding agent comprised of

(1) 50 to 99.5 weight % of a pulverulent, free-flowing ammonium polyphosphate of the general formula

$$H_{(n-m)+2}(NH_4)_M P_n O_{3n+1}$$

in which n stands for a whole number with an average value of about 20 to 800 and the ratio of m/n is about 1, consisting of particles with a mean size of about 0.03 to 0.08 mm, and

(2) 0.5 to 50 weight % of a cured, water-insoluble synthetic resin selected from the group consisting of

(A) a polycondensation product of a polyol and an isocyanate,

(B) a polycondensation product of a polyol and a polyisocyanate,

(C) a polycondensation product of an isocyanate and/or a polyisocyanate,

(D) a polycondensation product of an aromatic hydroxy compound and formaldehyde,

(E) an epoxide resin, encapsulating the particles of said ammonium polyphosphate, at least one substance selected from binders, hardeners and conventional addends, and

(b) a covering or sealing veneer of wood or laminated sheet material glued to the chip board by means of a special binder.

4,701,374

MAGNETIC RECORDING MEDIUM

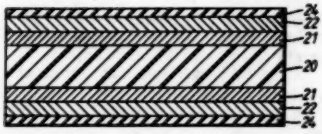
Masayuki Sagoi; Yoichiro Tanaka, and Hiroki Nakamura, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 1, 1985, Ser. No. 750,270

Claims priority, application Japan, Nov. 30, 1984, 59-253055; Nov. 30, 1984, 59-253058

Int. Cl.⁴ G11B *5/64, 5/72*

U.S. Cl. 428—336 **10 Claims**



1. A magnetic recording medium comprising:

a substrate;

at least one magnetic layer having an axis of easy magnetization in a direction perpendicular to a surface thereof, formed on the substrate; and

a film consisting essentially of silicon, nitrogen, and oxygen, formed on the magnetic layer, the amount of oxygen being selected so as to cause an absorption maximum of infrared radiation in the range of 830 cm^{-1} to 1100 cm^{-1} of $1/\lambda$ where λ is the wavlength of the infrared radiation.

4,701,375

MAGNETIC RECORDING MEDIUM

Masaharu Nishimatsu, Komoro; Suguru Takayama, Tokyo, and Hiroyuki Arioka, Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 696,355, Jan. 1, 1983, abandoned. This application Oct. 24, 1986, Ser. No. 922,752

Claims priority, application Japan, Feb. 1, 1984, 59-15258; Feb. 1, 1984, 59-15259

Int. Cl.⁴ G11B *5/71, 5/72*

U.S. Cl. 428—336 **7 Claims**

1. A magnetic recording medium comprising a non-magnetic substrate, a feromagnetic film of the non-binder type formed on one side of said substrate; and, on the surface of the magnetic recording layer, a topcoat layer from 10 angstroms to 100 angstroms thick comprising a lubricant and an antioxidant which is a phosphoric ester of the type curable by radiation.

4,701,376

PROFILED STRIP FOR SEALINGLY BORDERING WINDOW OR DOOR OPENINGS IN MOTOR VEHICLES AND BUILDINGS

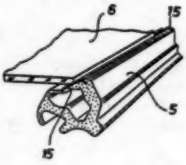
Dietmar Hermann, Garbsen, and Siegfried Walter, Hanover, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Feb. 13, 1986, Ser. No. 829,523

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3505016

Int. Cl.⁴ D02G *3/00*; E06B *7/16*; B32B *3/04, 5/16*

U.S. Cl. 428—358 **3 Claims**



1. A profiled strip for sealingly bordering window or door openings in motor vehicles and buildings while at the same time permitting relative sliding movement between the strip and a windowpane or door panel; said strip having improvement therewith to overcome binding problems between materials at least one of which has sliding movement as a characteristic wherein said improvement to overcome binding problems comprises:

a profiled main strip made of a first material, which is a mixture of a rubber-like elastomer, with said mixture also containing silicic acid as an admixture component to overcome binding problems; and

at least one overlay strip that is made of a second, different material, and that is disposed on a portion of the outer periphery of said main strip; each of said overlay strips extends over the entire length of said main strip, and said at least one overlay strip is bonded to the latter more effectively due to said mixture also containing silicic acid as an admixture component to overcome binding problems;

said second material of each of said overlay strips being a synthetic material that contains fluorine;

the proportion of silicic acid in said elastomeric mixture of said first material of said main strip being at least 10% of the amount of elastomer.

4,701,377

POLYAMIDE FIBERS HAVING IMPROVED PROPERTIES, AND THEIR PRODUCTION

Kazuo Kurita, Ohtsu, and Hideaki Ishihara, Uji, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Feb. 20, 1986, Ser. No. 831,376

Claims priority, application Japan, Feb. 20, 1985, 60-32218

The portion of the term of this patent subsequent to Mar. 12, 2002, has been disclaimed.

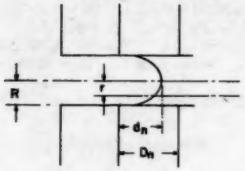
Int. Cl.⁴ D02G *3/00*

U.S. Cl. 428—364 **8 Claims**

1. A polyamide fiber excellent in strength, comprising at least one of polycapramide, polyhexamethylene adipamide and polytetramethylene adipamide in an amount not less than 60% by weight on the basis of the polyamide fiber, having a relative viscosity of not less than 2.3 and less than 3.5, measured on a 96% by weight sulfuric acid solution having a polyamide concentration of 10 mg/ml at 20° C., an index of birefringence (Δn), measured after 24 hours under the conditions of 30° C. and 80% relative humidity of not less than 55×10^{-3}, and a tenacity of not less than 12.0 g/d, the index of birefringence in section of the fiber satisfying the following relationship:

$$\Delta n_A - \Delta n_B \geqq 0$$

wherein Δn_A is the index of birefringence of the fiber at the



position of $r/R=0.9$, Δn_B is the index of birefringence of the fiber at the position of $r/R=0.0$, R is the radius of the fiber section, and the tenacity and the break elongation satisfying the following relationship.

$$\text{Tenacity} \times (\text{Break elongation})^{\frac{1}{2}} \geqq 46.0\ g/d \cdot \sqrt{\%}\ .$$

4,701,378

BONDING PROCESS USING CURABLE EPOXIDE RESIN ADHESIVE

Madan M. Bagga, Cambridge, and Christopher H. Bull, Trumpington, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 2, 1986, Ser. No. 847,365

Claims priority, application United Kingdom, Apr. 2, 1985, 8508628

Int. Cl.⁴ B05D *1/36;* **C09J** *5/02*

U.S. Cl. 428—414 **20 Claims**

1. A method of effecting adhesion between two surfaces selected from the group consisting of metals, reinforced plastics, glass, friction materials and ceramics, which comprises

(i) applying to one or both surfaces a curable composition comprising

(a) an epoxide resin

(b) a nitrogen-containing latent curing agent for the epoxide resin and

(c) as cure accelerator dispersed as a powder in a mixture of (a) and (b), a solid solution of a nitrogen base having a boiling point above 130° C. and a polymeric phenol which is a condensation product of a phenol with an aldehyde, said solid solution being prepared in the absence of an epoxy resin,

(ii) placing the two surfaces together with the composition positioned therebetween to form an assembly, and

(iii) heating the assembly until the composition solidifies.

20. A bonded assembly comprising two surfaces selected from the group consisting of metals, reinforced plastics, glass, friction materials and ceramics adhered together by a composition comprising

(a) an epoxide resin,

(b) a nitrogen-containing latent curing agent for the epoxide resin and

(c) as cure accelerator dispersed as a powder in a mixture of (a) and (b), a solid solution of a nitrogen base having a boiling point above 130° C. and a polymeric phenol which is a condensation product of a phenol with an aldehyde, said solid solution being prepared in the absence of an epoxy resin, said composition being heat-cured.

4,701,379

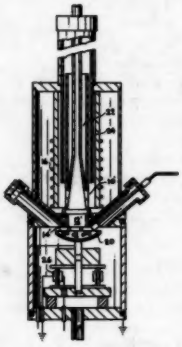
BORON HYDRIDE POLYMER COATED SUBSTRATES

Richard K. Pearson, Pleasanton; Roman I. Bystroff, and Dale E. Miller, both of Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 27, 1986, Ser. No. 900,859

Int. Cl.⁴ B05D *3/06*

U.S. Cl. 428—427 **17 Claims**



1. A method of coating a substrate with a uniformly smooth layer of boron hydride polymer, comprising:

(a) providing an apparatus for generating a boron hydride plasma, said apparatus comprising wall means defining a sealable plasma chamber, inlet and outlet means operatively connected to said chamber, and means for generating a plasma discharge within said chamber;

(b) disposing a substrate within said chamber;

(c) evacuating said chamber through said outlet means;

(d) introducing a boron hydride feedstock into said chamber through said inlet means; and

(e) generating a plasma discharge within said chamber simultaneously with the introduction of said hydride feedstock into said chamber and continuing said discharge therein to form a boron hydride plasma of ions, electrons and free radicals which interact to form on said substrate a layer of boron hydride polymer wlth a uniformly smooth surface.

13. An article of manufacture, comprising a glass or polymer microballoon fusion target coated with a layer of boron hydride polymer.

4,701,380

CURABLE SILICONE COMPOSITION FOR CORROSION PROTECTION

Dipak Narula; Anh Be, and Charles P. Zemanek, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 2, 1987, Ser. No. 218

Int. Cl.⁴ B32B *9/04*

U.S. Cl. 428—447 **24 Claims**

1. A composition comprising:

(I) from about 1 to 99 parts by weight of a liquid organopolysiloxane copolymer, prepared by a method comprising (A) forming a homogeneous mixture having an acid number greater than zero and consisting essentially of (a) an organic solvent solution of a resinous copolymeric siloxane containing silicon-bonded hydroxyl radicals and consisting essentially of $R_3SiO_{\frac{1}{2}}$ units and $SiO_{4/2}$ units wherein the ratio of $R_3SiO_{\frac{1}{2}}$ units to $SiO_{4/2}$ units is 0.6:1 to 0.9:1 and each R denotes, independently, a monovalent hydrocarbon radical and (b) a liquid organohydrogenpolysiloxane wherein each organic radical is, independently, a

monovalent hydrocarbon radical, there being an average of at least one silicon-bonded hydrogen radical per molecule of said organohydrogenpolysiloxane, and (B) heating said homogeneous mixture to remove substantially all of said organic solvent therefrom;

(II) from about 1 to 99 parts by weight of a hydroxy-functional diorganopolysiloxane having the average formula $(HO)R'''_2SiO(R'''_2SiO)_cSiR'''_2(OH)$ wherein R''' is a group selected from alkyl, cycloalkyl, haloalkyl, aromatic or haloaromatic radicals and c has a value sufficient to provide a viscosity of about 1 to 1,000,000 Poise at 25° C. for the diorganopolysiloxane; and

(III) from about 0.1 to 10 parts by weight, per 100 parts of said component (I) plus component (II), of at least one organosilane having the formula $QSi(OR'''')_3$ wherein the group Q is selected from vinyl, 3-glycidoxypropyl, 3-methacryloxypropyl or 3-(N-styrylmethyl-2-aminoethylamino)-propyl hydrochloride groups and R'''' is selected from alkyl groups having 1 to 4 carbon atoms, alkoxyalkyl groups having a total of up to 5 carbon atoms or the acetyl group.

4,701,381
COMPOSITE MATERIALS AND PRODUCTS

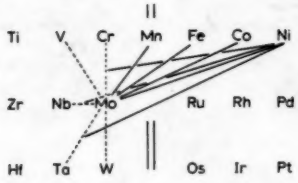
Kenneth H. Jack, North Shields, Great Britain, assignor to The University of Newcastle Upon Tyne, Newcastle Upon Tyne, Great Britain

Filed Jul. 18, 1985, Ser. No. 756,453

Claims priority, application United Kingdom, Jul. 18, 1984, 8418363

Int. Cl.⁴ C22C *29/04, 29/16*

U.S. Cl. 428—548 **7 Claims**



1. A composite material or product comprising a mixed metal interstitial alloy together with a metallic carrier, the alloy having the beta-Mn metal-atom arrangement and the formula X_2Y_3Z, wherein:

X is selected from at least one of the group consisting of manganese, iron, cobalt and nickel,

Y is selected from at least one of the group consisting of vanadium, niobium, tantalum, chromium and molybdenum, and

Z is a compound selected from at least one of the group consisting of nitride and carbonitride.

4,701,382
LIQUID COATING COMPOSITION CONTAINING LUBRICANTS

Patrick Pichant, Senlis, France, assignor to Akzo N.V., Netherlands

Filed Mar. 20, 1985, Ser. No. 713,965

Claims priority, application Netherlands, Mar. 22, 1984, 8400903

Int. Cl.⁴ B32B *15/04;* **B05D** *3/02*

U.S. Cl. 428—457 **13 Claims**

1. A liquid coating composition based on a binder and an electrically conductive pigment in an amount of at least 30 percent by volume, calculated on the pigment and binder, characterized in that the coating composition contains at least 2 solid, powdered lubricants in a total amount of 0.05–5 percent by weight, calculated on the coating composition, at least one of them being an inorganic lubricant.

4,701,383
LIGNOSULFONATE-PHENOL-FORMALDEHYDE RESIN BINDER IN SHEET MATERIAL AND METHOD OF MAKING SAID SHEET MATERIAL

Eugene R. Janiga, Roselle, Ill., assignor to Masonite Corporation, Chicago, Ill.

Continuation of Ser. No. 564,236, Dec. 21, 1983, Pat. No. 4,559,097, Continuation-in-part of Ser. No. 427,841, Sep. 29, 1982, Pat. No. 4,423,173. This application Dec. 16, 1985, Ser. No. 809,216

The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.⁴ B29J *5/02;* **C09J** *3/28*

U.S. Cl. 428—527 **5 Claims**

1. A plywood article manufactured by applying a binder comprising a polymer between two layers of wood and pressing said wood layers together under conditions sufficient to adhere said layers together, the improvement comprising said polymer wherein said polymer is formed by heating a mixture of phenol, formaldehyde, and a lignosulfonate consisting essentially of the lignosulfonates in a waste sulfite or sulfited cooking liquor as recovered from a pulping process under alkaline conditions, said lignosulfonate being added to said phenol and formaldehyde before a substantial amount of reaction between said phenol and said formaldehyde and reacting said mixture to form said polymer.

4. A method of manufacturing a sheet material formed from a plurality of discrete wood pieces adhered together, including contacting a plurality of discrete sheet material members with a binding resin; disposing each of said sheet material members in contact with at least one other of said sheet material members and pressing said sheet material members together with sufficient heat and pressure to form a sheet material, the improvement comprising said binding resin, wherein said resin is formed by mixing a lignosulfonate consisting essentially of the lignosulfonates in a waste sulfite or sulfited cooking liquor as recovered from a pulping process, phenol, formaldehyde and an alkali to form a reaction mixture and heating said mixture to polymerize said mixture, said lignosulfonate being added to said reaction mixture before a substantial amount of reaction between said phenol and said formaldehyde.

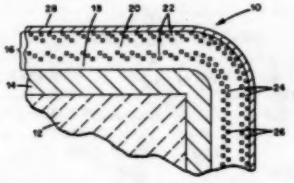
4,701,384
COMPOSITE COATINGS ON CEMENTED CARBIDE SUBSTRATES

Vinod K. Sarin, Lexington, Mass., and Hans E. Hintermann, Ins, Switzerland, assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 20, 1987, Ser. No. 4,999

Int. Cl.⁴ B32B *9/00*

U.S. Cl. 428—688 **13 Claims**



1. A wear resistant article comprising:

a cemented carbide substrate body; and

a fully dense, adherent, wear resistant, composite ceramic coating having at least two phases on the substrate comprising:

a continuous oxide layer about 0.1–20 microns thick of a material selected from the group consisting of the oxides of aluminum, zirconium, and yttrium; and

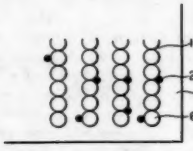
at least one discontinuous additional phase dispersed as discrete particles within the oxide layer, of at least one material selected from the group consisting of oxides of aluminum, zirconium, and yttrium, the at least one material being different from that of the oxide layer.

4,701,385

ION-IMPLANTED MAGNETIC BUBBLE DEVICE AND A METHOD OF MANUFACTURING THE SAME

Ryo Imura, Tokorozawa; Tadashi Ikeda, Kanagawa, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 12, 1984, Ser. No. 680,891
Claims priority, application Japan, Dec. 14, 1983, 58-234244
Int. Cl.[4] B32B 9/00
U.S. Cl. 428—693 12 Claims



1. An ion-implanted magnetic bubble device having a magnetization layer magnetized in an in-plane direction which is formed by implanting ions in a magnetic garnet film capable of holding magnetic bubbles at desired portions of the surface region thereof, wherein ions implanted for forming said magnetization layer include only those species whose projected standard deviation is not greater than 1000 Å, said ion-implantation being followed by a heat treatment at a high temperature, said ion-implantation being performed only once prior to the heat treatment and being the only ion implantation performed prior to the heat treatment.

4,701,386

BATTERY COMPRISING DUAL TERMINAL BUSHINGS

William H. Kump, Mendota Heights, and Joseph J. Jergl, Minneapolis, both of Minn., assignors to GNB Incorporated, Mendota Heights, Minn.

Division of Ser. No. 770,946, Aug. 30, 1985, Pat. No. 4,645,725.
This application Feb. 24, 1987, Ser. No. 17,516
Int. Cl.[4] H01M 2/30
U.S. Cl. 429—179 12 Claims

1. A dual terminal, electric storage battery comprising:

(a) a container;

(b) a cover;

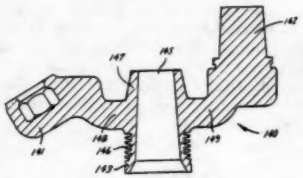
(c) a single pair of element posts in electrical communication with electrochemical components;

(d) a single pair of terminal bushings substantially completely embedded in said cover, each of said bushings being electrically connected to one of said element posts and comprising,

(i) a body portion,

(ii) a side terminal end, which side terminal end is mounted through an opening in an angled surface of said cover, which angled surface is at an angle acute to the plane generally contiguous to the top surface of said cover,

(iii) a top terminal end, which top terminal end is mounted through an opening in said top surface of said cover on or in the vicinity of its longitudinal center line,



(iv) an element post end,

(v) a first connecting arm extending sideways from said body portion to said side terminal end,

(vi) a second connecting arm extending sideways from said body portion to said top terminal end, wherein said body portion and said element post end define a hole passing axially therethrough and adapted to receive therein one of said element posts;

(e) a pair of side terminals in electrical communication with said side terminal ends of said bushings; and

(f) a pair of top terminals in electrical communication with said top terminal ends of said bushings.

4,701,387

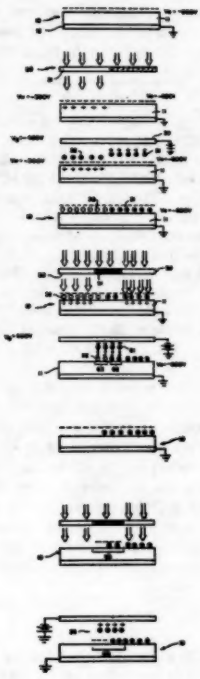
PLURAL-STAGE LIQUID DEVELOPMENT OF ELECTROSTATIC CHARGE PATTERNS

Peter S. Alexandrovich, Rochester; Domenic Santilli, Webster, and Yee S. Ng, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 16, 1986, Ser. No. 886,143
Int. Cl.[4] G03G 13/10, 13/22
U.S. Cl. 430—45 9 Claims

1. The method of plural-stage liquid development of electrostatic charge patterns which comprises forming an electrostatic charge pattern on an insulating surface of an electrostatic recording element, developing the charge pattern with a liquid developer comprising an insulating carrier liquid, a toner and an ionic charge-control agent, rinsing the developed surface of the element with a polar rinse liquid which is not a solvent for the toner or for the surface of the recording

element, forming a second electrostatic charge pattern on the element which extends into areas of the surface not previously



developed with toner, and developing the second charge pattern with a liquid developer.

4,701,388

INSTANT FILM UNIT WITH COLORING MEANS

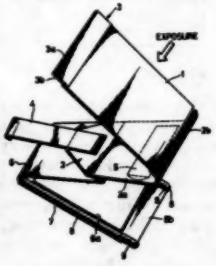
Kazuyuki Yoshimura, and Yoshio Sakakibara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 10, 1986, Ser. No. 884,302

Claims priority, application Japan, Jul. 10, 1985, 60-105383[U]

Int. Cl.⁴ G03C *5/54, 3/00*

U.S. Cl. 430—209 **5 Claims**



1. A peel-apart instant film unit including two separate sheets comprising a photosensitive sheet and an image-receiving sheet, and means coupling said two separate sheets to each other and having a rupturable pod containing therein a developer reagent, said coupling means being adapted to superimpose said two separate sheets when said coupling means is withdrawn from a camera or film holder so as to spread the developer reagent released from said pod between said two sheets, said film unit comprising:

means attached to said coupling means for forming a passage in cooperation with said coupling means, said passage being adapted to direct said developer reagent released from said pod between said two sheets;

means attached to said photosensitive sheet at its rear end for forming a trapping space which collects an excess of said developer reagent therein; and

coloring means provided on one of said passage forming means and said trapping space forming means and adapted to change in color upon contact with said developer reagent, said color change giving a visible indication of the time of completion of the development of said film unit.

4,701,389

PHOTOCONDUCTIVE TONER

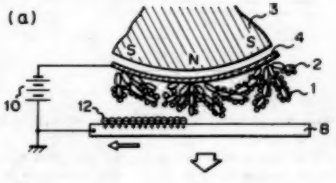
Teruyo Morimoto, Kobe; Yumiko Sano, Ibaragi; Eiji Nimura, Tondabayashi; Yuji Tomii, Sakai, and Tatsuo Maeda, Nishinomiya, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 9, 1986, Ser. No. 883,656

Claims priority, application Japan, Jul. 11, 1985, 60-153778

Int. Cl.⁴ G03G *9/08*

U.S. Cl. 430—110 **2 Claims**



1. A photoconductive toner having a particle size of 9 to 12 μm, which comprises (i) a photoconductive substance, (ii) 0.2 to 10 parts by weight, per part by weight of said photoconductive substance, of a binder resin medium and (iii) 1.5 to 10 parts by weight, per part by weight of said photoconductive substance, of a charge transport substance, said photoconductive substance and said charge transport substance being dissolved or dispersed in said binder resin medium, wherein said photoconductive substance is at least one p-type semiconductor selected from the group consisting of Se, phthalocyanine, perylene, squalinic acid derivatives, azo pigments and indigo pigments, said binder resin medium has a positive tribochargeability such that when said binder resin medium is tribocharged by at least one tribocharging member selected from the group consisting of iron and ferrite powders, said binder resin medium is positively charged, said binder resin medium is at least one resin selected from the group consisting of polyamide resins, polyimide resins and 1-vinylpyridine-containing copolymer resins, and said charge transport substance is at least one hole transport substance selected from the group consisting of hydrazone, pyrazolone, polyvinylcarbazole and oxadiazole.

4,701,390

THERMALLY STABILIZED PHOTORESIST IMAGES

John J. Grunwald, New Haven, and Allen C. Spencer, Naugatuck, both of Conn., assignors to MacDermid, Incorporated, Waterbury, Conn.

Filed Nov. 27, 1985, Ser. No. 802,514
Int. Cl.[4] G03C 5/00
U.S. Cl. 430—325 15 Claims

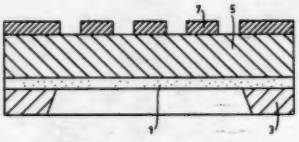
1. A process for thermally stabilizing a photoresist image layer formed on a substrate, said process comprising coating said image layer with a protective film of a thermally stabilizing material in solution in water or water-miscible solvent prior to subjecting said image layer to a post-development bake, wherein said thermally stabilizing material consists essentially of a compound or a mixture of two or more compounds selected from the group consisting of chromotropic acid, perfluorocarbon carboxylic acids, perfluorocarbon-sulfonic acids, perfluorocarbon phosphonic acids, and alkali metal, ammonium and amine salts of said acids, ethoxylated perfluorocarbon alcohols, and quaternary ammonium salts of N-perfluoroalkyl-N',N''-dialkylamines.

4,701,391

MASK WITH MAGNESIUM DIAPHRAGM FOR X-RAY LITHOGRAPHY

Arno Lentfer, Hamburg, and Holger Lüthje, Halstenbek, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 528,355, Aug. 31, 1983, abandoned.
This application Jan. 24, 1986, Ser. No. 824,294
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232499
Int. Cl.[4] G21K 5/00; G03F 1/00
U.S. Cl. 430—5 1 Claim



1. A mask for forming patterns in lacquer layers by x-ray lithography comprising:

a multilayer diaphragm being highly transparent to X-ray radiation, said multilayer diaphragm including a layer of magnesium and at least one additional layer, and

a patterned layer on one major surface of said multilayer diaphragm for absorbing said X-ray radiation, said patterned layer contacting said layer of magnesium, wherein said at least one additional layer includes a layer of gold and a layer of titanium oxide (TiO_2), said layer of titanium oxide (TiO_2) contacting said layer of magnesium at a side opposite to said patterned layer.

4,701,392

MEMBER HAVING LIGHT RECEIVING LAYER WITH NONPARALLEL INTERFACES AND ANTIREFLECTION LAYER

Keishi Saitoh, Ibaraki; Masahiro Kanai, Tokyo; Tetsuo Sueda, Chofu; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Kyosuke Ogawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1985, Ser. No. 719,980
Claims priority, application Japan, Apr. 6, 1984, 59-69598
Int. Cl.[4] G03G 5/085
U.S. Cl. 430—57 47 Claims

1. A light receiving member comprising a substrate for light receiving member, a surface layer having reflection preventive function and a light receiving layer of a multi-layer structure having at least one photosensitive layer comprising an amorphous material containing silicon atoms on the substrate, said light receiving layer having at least one pair of non-parallel interfaces within a short range and said non-parallel interfaces being arranged in a large number in at least one direction within the plane perpendicular to the layer thickness direction.

4,701,393

MEMBER WITH LIGHT RECEIVING LAYER OF A-SI(GE) AND A-SI AND HAVING PLURALITY OF NON-PARALLEL INTERFACES

Keishi Saitoh, Ibaraki; Masahiro Kanai, Tokyo; Tetsuo Sueda, Chofu; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Kyosuke Ogawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1985, Ser. No. 720,011
Claims priority, application Japan, Apr. 6, 1984, 59-69599; Apr. 9, 1984, 59-70474; Apr. 9, 1984, 59-70475; Apr. 17, 1984, 59-77283; Apr. 18, 1984, 59-78080; Apr. 19, 1984, 59-79006
Int. Cl.[4] G03G 5/085
U.S. Cl. 430—57 91 Claims

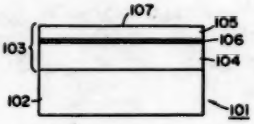
1. A light receiving member comprising a light receiving layer of a multi-layer structure having a first layer comprising an amorphous material containing silicon atoms and germanium atoms, a second layer comprising an amorphous material containing silicon atoms having reflection preventive function provided on a substrate successively from the substrate side, said light receiving layer having at least one pair of non-parallel interfaces within a short range and said non-parallel interfaces being arranged in a large number in at least one direction within the plane perpendicular to the layer thickness direction.

4,701,394

IMAGE FORMING MEMBER FOR ELECROPHOTOGRAPHY

Eiichi Inoue, Tokyo; Isamu Shimizu, and Toshiyuki Komatsu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 358,536, Mar. 16, 1982, which is a continuation of Ser. No. 131,495, Mar. 18, 1980. This application Oct. 24, 1986, Ser. No. 923,027
Claims priority, application Japan, Mar. 26, 1979, 54-35313
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.[4] G03G 5/082, 5/14
U.S. Cl. 430—57 17 Claims



1. An image-forming member for electrophotography comprising a substrate, a hydrogenated amorphous silicon layer containing from 1 to 40 atomic percent of hydrogen and an amorphous inorganic semiconductor layer composed of an amorphous inorganic semiconductor having band gap ϵ_g larger than band gap E_g of said hydrogenated amorphous silicon and having effective dark resistance for forming electrophotographic images; said hydrogenated amorphous silicon layer being laminated to said amorphous inorganic semiconductor layer whereby a heterojunction is provided in the contact portion between the former layer and the latter layer.

4,701,395

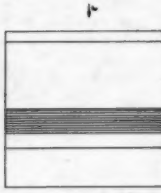
AMORPHOUS PHOTORECEPTOR WITH HIGH SENSITIVITY TO LONG WAVELENGTHS

Christopher R. Wronski, Annandale, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 735,677, May 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 703,083, Feb. 19, 1985, abandoned. This application Apr. 7, 1986, Ser. No. 848,957

Int. Cl.[4] G03G *5/082, 5/14;* **H01J** *31/00, 31/26*

U.S. Cl. 430—58 **12 Claims**



1. A photoconductive member sensitive to infrared radiation comprising:

(a) a layer of material capable of transporting charge;

(b) a superlattice having at least ten layers of amorphous semiconductor material formed from alternating layers of a-Si and a-Ge or alloys thereof adjacent to said layer of material capable of transporting charge, wherein each of said alternating layers is between 5 Å and 100 Å;

(c) a first blocking layer adjacent to one of said layer of material capable of transporting charge and said multilayered amorphous semiconductor;

(d) a support layer adjacent to one of said first blocking layer and said material capable of transporting charge.

4,701,396

PHOTOCONDUCTIVE PHTHALOCYANINE PIGMENTS, ELECTROPHOTOGRAPHIC ELEMENTS CONTAINING THEM AND A METHOD OF USE

Yann Hung; Thomas R. Klose; Michael T. Regan, and Louis J. Rossi, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 6, 1986, Ser. No. 860,352

Int. Cl.[4] G03G *5/06*

U.S. Cl. 430—58 **21 Claims**

1. A photoconductive titanylphthalocyanine pigment having fluorine ring substitution.

4,701,397

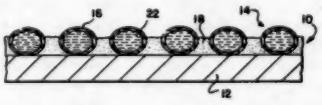
METHOD FOR FORMING IMAGES ON PLAIN PAPER AND AN IMAGING SHEET USEFUL THEREIN

John K. Rourke, Chillicothe, and Joseph G. O'Connor, Springboro, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 26, 1986, Ser. No. 834,097

Int. Cl.[4] G03C *1/00, 1/72, 5/00*

U.S. Cl. 430—138 **8 Claims**



1. A process for forming images on plain paper which comprises image-wise exposing an imaging sheet comprising a support having a plurality of photosensitive microcapsules and a developer-containing resin on the surface thereof, said microcapsules and said developer-containing resin being present in the same layer or in contiguous layers on the surface of said support, said microcapsules containing an internal phase which includes a photosensitive composition which changes in viscosity in response to exposure to actinic radiation and a color former which is capable of reacting with said developer and forming a visible dye image, to actinic radiation to form latent image and non-image areas, assembling said imaging sheet with a sheet of plain paper such that said microcapsules and said developer-containing resin are interposed between said support and said paper, heating said assembly, subjecting said assembly to a uniform force which causes said microcapsules to rupture and causes said developer-containing resin and said internal phase from said ruptured microcapsules in said image areas to adhere to the surface of said sheet of plain paper, and separating said imaging sheet from said plain paper whereby said image areas selectively adhere to said plain paper and said non-image areas remain adhered to said support.

4,701,398

PHOTOGRAPHIC FILM CONTAINING DIRECT POSITIVE DYES MADE FROM 3-INDOLIZINE CARBOXALDEHYDE

James W. Wheeler, Fairport, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

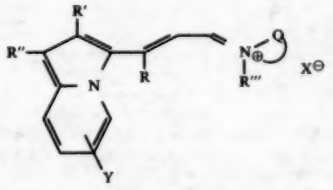
Division of Ser. No. 719,053, Apr. 2, 1985, Pat. No. 4,614,801, which is a continuation-in-part of Ser. No. 598,187, Apr. 9, 1984, abandoned. This application Mar. 14, 1986. Ser. No. 839,581

Int. Cl.[4] G03C *1/22, 1/485*

U.S. Cl. 430—510 **5 Claims**

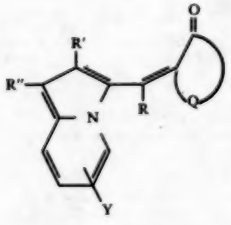
1. A direct positive photographic film comprising a support, a fogged gelatino-silver halide emulsion on said support characterized in that the emulsion contains an effective amount of a spectral sensitizing dye selected from the group consisting of a cyanine having the structure:

I.



wherein R is H or alkyl of 1–4 carbon atoms; R′ and R″ are H, alkyl of 1–7 carbon atoms, substituted alkyl, aryl, or substituted aryl; R‴ is H, alkyl of 1–7 carbon atoms, alkenyl of not more than 7 carbon atoms, substituted alkyl, aryl, or substituted aryl; Y is hydrogen, alkyl of 1–4 carbon atoms, NO_2 or halogen; Q represents sufficient carbon, nitrogen, and/or sulfur atoms to form a 5- or 6-member heterocyclic ring, or substituted heterocyclic ring; and X is an anion; and, a merocyanine having the structure:

II.



wherein R is H or alkyl of 1–4 carbon atoms; R′, R″ and Y are as defined above; and Q represents sufficient carbon, nitrogen, and/or sulfur atoms to form a 5- or 6-member heterocyclic or substituted heterocyclic ring with the proviso that when Q in formula I and II forms a substituted heterocyclic ring, the substituents may be such as to form a fused ring system.

4,701,399

PHOTOSENSITIVE COMPOSITION WITH 2-HALOMETHYL-5-SUBSTITUTED-1,3,4-OXADIAZOLE

Teruo Nagano, Kanagawa; Tadao Toyama, and Akira Nagashima, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

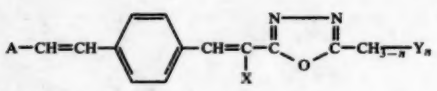
Filed Feb. 25, 1985, Ser. No. 705,265

Claims priority, application Japan, Feb. 24, 1984, 59-34080

Int. Cl.⁴ G03C *1/60, 1/70, 1/71, 1/727*

U.S. Cl. 430—179 **9 Claims**

1. A photosensitive composition comprising in admixture a photosensitive diazo compound or a photopolymerizable compound having an ethylenically unsaturated bond, and a 2-halomethyl-5-substituted-1,3,4-oxadiazole compound represented by general formula (I) and a color changing agent which is colored and discolors or fades by the action of a light decomposition product of the 2-halomethyl-5-substituted-1,3,4-oxadiazole compound:



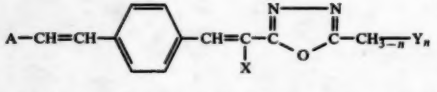
(I)

wherein A represents a substituted or unsubstituted aromatic residue; X represents a hydrogen atom, a cyano group, an alkyl group or an aryl group; Y represents a chlorine atom or a bromine atom; and n represents an integer of 1 to 3; and wherein the 2-halomethyl-5-substituted-1,3,4-oxadiazole compound and the color changing agent are present in an amount of from 0.01 to 50 parts by weight and up to 50 parts by weight, respectively, based on 100 parts by weight of the photosensitive diazo compound or the photopolymerizable compound having an ethylenically unsaturated bond.

5. A photopolymerizable composition comprising in admixture:

(1) a photopolymerizable compound which is an ester of an unsaturated carboxylic acid, and

(2) a photopolymerization initiator, wherein said photopolymerization initiator is a 2-halomethyl-5-substituted-1,3,4-oxadiazole compound represented by the following general formula (I):



(I)

wherein A represents a substituted or unsubstituted aromatic residue; X represents a hydrogen atom, a cyano group, an alkyl group or an aryl group; Y represents a chlorine atom or a bromine atom; and n represents an integer of 1 to 3, and wherein said photopolymerization initiator is present in an amount of from 0.01 to 50 parts by weight based on 100 parts by weight of said photopolymerizable compound.

4,701,400

SILVER SALT DIFFUSION TRANSFER PHOTOGRAPHIC ELEMENT WITH CATIONIC POLYMER

Kazunobu Katoh, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 6, 1986, Ser. No. 871,358

Claims priority, application Japan, Jun. 7, 1985, 60-123864

Int. Cl.⁴ G03C *5/54*

U.S. Cl. 430—233 **12 Claims**

1. A silver salt diffusion transfer photographic element comprising a support and an image-receiving layer containing at least a silver-precipitating nucleus wherein a layer containing cellulose acetate having a degree of acetylation of 40 to 49% and a cationic polymer electrolyte is sandwiched between the support and the image-receiving layer.

4,701,401

PROCESS FOR THE FORMATION OF A LINEWORK OR HALFTONE MULTICOLOR COLLOID PATTERN

Luc H. Leenders, Herentals; Charles L. Ramon, Mortsel, and Edie R. Daems, Herentals, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Nov. 29, 1985, Ser. No. 802,679

Claims priority, application European Pat. Off., Dec. 4, 1984, 84201798.0

Int. Cl.⁴ G03C *1/90, 7/22*

U.S. Cl. 430—257 **11 Claims**

1. Process for forming a linework or halftone multicolour colloid pattern which comprises the following steps in sequence:

(1) scanningwise exposing with light a multicolour original to obtain separate red light, green light and blue light output signals and receiving said separate signals by photon-detectors to produce corresponding separate series of electrical signals;

(2) feeding said separate series of electrical signals to a computer and exposing under control of said computer according to the corresponding series of signals coloured hardening developable photographic materials comprising a temporary support carrying one or more hardenable hydrophilic colloid layers at least one of which is coloured distinctively from the layers of the other materials and at least one of which contains dispersed photosensitive silver halide, thereby forming in each such photographic material a latent image in accordance with the series of electrical signals corresponding to that material;

(3) transferring all such hardenable hydrophilic colloid layers of one of said exposed photographic materials from the temporary support therefor onto a permanent support, that at its surface is less hydrophobic than the temporary support, by pressing the permanent support in the presence of an aqueous liquid against the hydrophilic colloid layer side of said photographic material and removing the temporary support, thus leaving such hydrophilic colloid layers intact on said permanent support;

(4) developing the thus-transferred exposed photosensitive silver halide with a hardening developing agent to form in all such coloured hydrophilic colloid layers hardened images and unhardened background regions and removing the unhardened colloid portions to leave a coloured hardened colloid relief on the permanent support; and

(5) repeating steps (3) and (4) with the other scanningwise exposed differently coloured photographic materials, the transfer procedure of step (3) being effected with the image regions of said transferred layers in registration, whereby a composite relief image in said different colors is produced on said permanent support.

4,701,402

OXIDATIVE IMAGING

Ranjan C. Patel, Thorley; Ian J. Ferguson, Ickleton, and Herbert J. Pennicott, Harlow, all of United Kingdom, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 579,275, Feb. 13, 1984, abandoned. This application Dec. 30, 1985, Ser. No. 814,635
Int. Cl.[4] G03C 1/727
U.S. Cl. 430—332 26 Claims

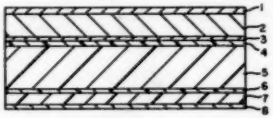
1. A radiation-sensitive element capable of recording an image upon image-wise exposure to radiation of selected wavelength, the element consisting essentially of, as the image-forming components, an effective amount of a bleachable dye to provide an optical density of 1.0 or more in reactive association with an iodonium salt.

4,701,403

TWO-LAYER PROCESS FOR APPLYING ANTISTATIC COMPOSITIONS TO POLYESTER SUPPORTS

Conrad E. Miller, Hendersonville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 691,768, Jan. 16, 1985, abandoned. This application Jun. 17, 1986, Ser. No. 875,251
Int. Cl.[4] G03C 1/82; B05D 3/04, 3/10, 3/02
U.S. Cl. 430—529 16 Claims



1. In a process wherein a polymeric shaped article is coated with an antistatic layer comprising:

(1) a water-soluble, electrically conductive polymer having functionally attached carboxylic acid groups integral to the polymer or incorporated therein by copolymerization; and

(2) a polyfunctional aziridine, the improvement comprising coating (1) as a first coating, drying said first coating, and then applying (2) from an aqueous solution contiguous to said first coating, followed by drying the total coating weights ranging from 1.5 to 4.0 mg/dm^2.

4,701,404

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL OF HIGH SENSITIVITY AND IMPROVED GRANULARITY

Toshifumi Iijima, Kokubunji; Yoshitaka Yamada, Hino; Kenji Kumashiro, Hachioji; Takashi Kamio, Hachioji, and Shinya Shimura, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Sep. 13, 1985, Ser. No. 775,683
Claims priority, application Japan, Sep. 14, 1984, 59-193611
Int. Cl.[4] G03C 7/00, 7/26
U.S. Cl. 430—559 6 Claims

1. A silver halide color photographic material having blue-, green- and red-sensitive silver halide emulsion layers coated on a support, each layer being composed of a plurality of sub-layers having different sensitivities, wherein at least a red-sensitive silver halide emulsion sub-layer having high sensitivity is provided between a first green-sensitive silver halide emulsion sub-layer of high sensitivity and a second green-sensitive silver halide emulsion sub-layer having a lower sensitivity than said first green-sensitive sub-layer, the grains in said first green-sensitive sub-layer and/or said red-sensitive sub-layer with high sensitivity being monodispersed and at least one of said first green-sensitive sub-layer and said red-sensitive sub-layer having a maximum color density of formed dye in said material higher than 0.6 but not exceeding 1.3.

4,701,405

DYE-SENSITIZED LIGHT-SENSITIVE CORE/SHELL SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hideki Takiguchi; Yoshitaka Yamada; Hirofumi Ohtani, and Hiroshi Kashiwagi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 558,944, Dec. 7, 1983, abandoned. This application Aug. 26, 1985, Ser. No. 769,764
Claims priority, application Japan, Dec. 13, 1982, 57-219065
Int. Cl.[4] G03C 1/19
U.S. Cl. 430—567 7 Claims

1. A light-sensitive silver halide color photographic material having at least one silver halide emulsion layer on a support, characterized in that said silver halide emulsion layer includes substantially monodispersed non-tabular silver halide grains having a configuration of octahedral or tetradecahedral; said silver halide grains are core/shell type silver halide grains in which a silver iodide content is higher in core portions than in shell portions, said silver halide grains having regular grain sizes, and having a grain size distribution as defined by the following formula:

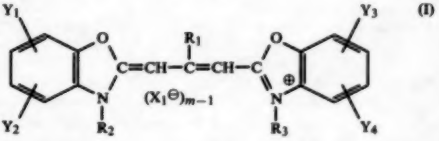
$$S = \sqrt{\frac{\Sigma(\bar{r} - r_i)^2 n_i}{\Sigma n_i}}$$

$$\frac{S}{\bar{r}} \leq 0.20$$

wherein S represents the standard deviation; $\bar{r}$ represents the average grain size; r_i represents individual grain sizes; and n_i represents numbers of r_i; provided that the $\bar{r}$ is defined by the following formula:

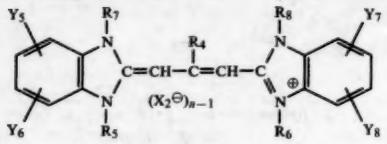
$$\bar{r} = \frac{\Sigma n_i r_i}{\Sigma n_i}$$

wherein n_i and r_i have the same meanings as defined above, said core portion of the silver halide grains comprising silver iodide at a level of 2 to 15 mole %; and said shell portion of the silver halide grains comprising silver iodide at a level of 0 to 4 mole %; and said silver halide grains are those which have been sensitized with a combination of at least one of sensitizing dyes represented by the following general formula (I) and at least one of sensitizing dyes represented by the following general formula (II):



(I)

wherein Y_1, Y_2, Y_3 and Y_4 each represent a hydrogen atom, halogen atom, hydroxyl group, alkoxy group, amino group, acylamido group, acyloxy group, alkoxycarbonyl group, alkoxycarbonylamino group, aryl group, cyano group or alkyl group, at least one of (i) Y_1 and Y_2, and (ii) Y_3 and Y_4 may be coupled to each other to form a ring or to form a naphthoxazole ring; R_1 represents a hydrogen atom or an alkyl group; R_2 and R_3 each represent an alkyl group; $X_1\ominus$ represents an anion; and m is an integer of 1 or 2, provided that when the m is 1, the R_2 or R_3 is a residue formable of an internal salt;



(II)

wherein Y_5, Y_6, Y_7 and Y_8 each represent a hydrogen atom, halogen atom, hydroxyl group, alkoxy group, amino group, acylamido group, acyloxy group, alkoxycarbonyl group, alkoxycarbonylamino group, aryl group, cyano group or alkyl group, at least one of (i) Y_5 and Y_6, and (ii) Y_7 and Y_8 may be coupled to each other to form a ring or to form a naphthodiazole ring; R_4 represents a hydrogen atom or alkyl group; R_5, R_6, R_7 and R_8 each represent an alkyl group; $X_2^{\ominus}$ represents an anion; and n is an integer of 1 or 2, provided that when the n is 1, R_5, R_6, R_7 or R_8 is a residue formable of an internal salt.

4,701,406

ASSAY FOR THE DETECTION OF EPIGENETIC TOXIC (NON-GENOTOXIC) SUBSTANCES

Iih-Nan Chou, Newton, Mass., assignor to Trustees of Boston University, Boston, Mass.

Filed Nov. 16, 1984, Ser. No. 685,828

Claims priority, application PCT Int'l Appl., Nov. 16, 1984, PCT/US84/01877

Int. Cl.[4] **G01N** *33/50, 33/53, 33/567, 33/574*

U.S. Cl. 435—7 **13 Claims**

1. A detection assay for the detection of a non-genotoxic substance in a test sample comprising the steps of:

preparing a culture of cells whose cytoskeleton elements are structurally identifiable, said elements being selected from at least one of the group consisting of microtubules, intermediate filaments, and microfilaments;

combining the test sample with said cultured cells as a mixture;

fixing said cells of said mixture after a pre-determined time period; and

detecting an identifiable disruption in the structure and organization of said cytoskeletal elements, said structural and organizational cytoskelton disruption identifying the presence of a toxic substance in the sample.

4,701,407

DIAGNOSIS OF ALZHEIMER DISEASE

Stanley H. Appel, Houston, Tex., assignor to Baylor College of Medicine, Houston, Tex.

Division of Ser. No. 444,293, Nov. 24, 1982, abandoned. This application Aug. 23, 1985, Ser. No. 769,861

Int. Cl.[4] **C12Q** *1/00*

U.S. Cl. 435—4 **4 Claims**

1. A method to diagnose the presence of Alzheimer's Disease in a subject by detecting a deficiency of a specific neurotrophic activity in said subject as compared to normal controls, wherein said deficiency is detected by the method which comprises:

extracting the proteins from the hippocampal tissue of said subject;

assaying said extract for neurotrophic activity with respect to the neuronal system normally associated with said hippocampal tissue; and

comparing said neurotrophic activity to activity exhibited in the same assay by similar extracts from hippocampel tissue of controls.

4,701,408

MONOCLONAL ANTIBODY TO ACTIVATED MACROPHAGES

Thomas P. Koestler, Collegeville, Pa., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Jan. 30, 1984, Ser. No. 574,807

Int. Cl.[4] **G01N** *33/53, 33/567, 33/577*

U.S. Cl. 435—7 **20 Claims**

13. A method of screening a solution or mixture for macrophage activating activity which comprises treating a macrophage culture with the solution or mixture for a time and under conditions sufficient to permit activation to occur; contacting the treated culture with an antibody of class IgG produced and secreted by a hybridoma formed by fusion of cells from a myeloma cell line and spleen cells from a mammal previously immunized with MAF-activated macrophage, the antibody being reactive with thioglycollate-, proteose-peptone-, Concanavalin A-, and LPS-elicited macrophages, but which is at least about three-fold more reactive with MAF-activated macrophages that with thioglycollate-elicited macrophages, for a time and under conditions sufficient to permit binding of the antibody to activated cells; and assaying for enhanced binding of the antibody to the cells, said enhanced binding being an indication of the presence of macrophage activating activity.

4,701,409

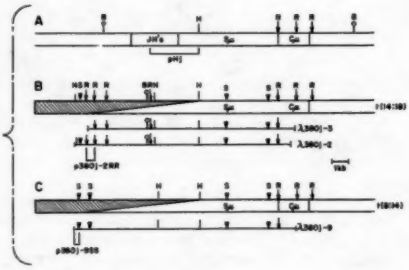
DETECTION OF B-CELL NEOPLASMS

Carlo M. Croce, Philadelphia, Pa., assignor to The Wistar Institute, Philadelphia, Pa.

Filed Nov. 15, 1984, Ser. No. 671,580

Int. Cl.[4] **C12Q** *1/68;* **C12P** *19/34;* **C12N** *15/00*

U.S. Cl. 435—6 **7 Claims**



1. A method for diagnosing B-cell neoplasm associated with translocated chromosomes comprising:

a. hybridizing a labeled DNA probe to restricted B-cell DNA, said DNA probe hybridizing to a region of DNA lying between a restriction site of a hybrid chromosome of a malignant B-cell and the breakpoint of said chromosome, said restriction site being unique to said region, said probe hybridizing to a chromosome selected from the group consisting of human chromosomes 11 and 18;

b. identifying the pattern of restricted chromosomal DNA segments to which the DNA probe hybridizes; and

c. detecting differences between the test pattern and the pattern for restricted normal chromosomal DNA.

2. A method for constructing a DNA probe for detecting malignant B-cells carrying a hybrid chromosome joined at a breakpoint, comprising:

a. constructing a genomic library of DNA from said malignant B-cells;

b. selecting clones containing DNA homologous to a region of chromosomal DNA spanning the breakpoint of the hybrid chromosome of said malignant B-cell; and

c. subcloning DNA fragments containing DNA homologous to chromosomal DNA on only one side of said breakpoint, said DNA fragments hybridizing to a human chromosome selected from the group consisting of 11 and 18.

4,701,410

METHOD FOR THE IMMUNOCHEMICAL DETERMINATION OF HEPATITIS B CORE ANTIGENS

Kuypers, Leonardus P. C., Jv Oss, and Gerrit Wolters, El Oss, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Aug. 28, 1984, Ser. No. 645,064
Claims priority, application Netherlands, Sep. 14, 1983, 8303169
Int. Cl.[4] G01N *53/00, 33/543*
U.S. Cl. 435—7 21 Claims

1. Method for the qualitative and/or quantitative immunochemical determination of hepatitis B core antigens (HBcAg), comprising incubating a liquid sample with carrier-bound immunoglobulins directed against hepatitis B surface antigens (HBsAg), separating the carrier-bound and liquid phases from one another, incubating the carrier-bound phase with an agent that breaks the HBsAg coat and releases HBcAg forming a solution with any HBcAg released, simultaneously with or subsequently to forming the solution incubating said solution with immunoglobulins directed against HBcAg, and determining the binding of HBcAg to immunoglobulins directed against HBcAg, giving a qualitative and/or quantitative measure of HBcAg in the sample.

4,701,411

BILIRUBIN-SPECIFIC ENZYME PREPARATION, ASSAY COMPOSITIONS, ANALYTICAL ELEMENTS AND METHODS USING SAME

Tai-Wing Wu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,486
Int. Cl.[4] A61K *37/50;* C12Q *1/26;* C12N *9/02, 11/00*
U.S. Cl. 435—25 22 Claims

1. A bilirubin-specific enzyme preparation comprising an enzyme isolated from a plant of the group of families consisting of Solanaceae, Musaceae and Liliaceae which, in the presence of a bilirubin-containing aqueous liquid, degrades bilirubin at a pH in the range of from about 6 to about 10 and a temperature in the range of from about 20° to about 50° C. without generation of hydrogen peroxide.

4,701,412

METHOD AND APPARATUS FOR PREVENTING CROSS-EXAMINATION OF BIOCHEMICAL TEST WELLS IN A MICROTITER TEST PLATE

Harry B. Naylor, Bellingham, Wash., assignor to Pasco Laboratories, Inc., Wheatridge, Colo.

Continuation-in-part of Ser. No. 723,360, Apr. 15, 1985. This application Mar. 3, 1986, Ser. No. 835,190
The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.
Int. Cl.[4] C12Q *1/24*
U.S. Cl. 435—30 5 Claims

1. The improved method for preventing cross-contamination of bacterial test wells in a multiple-well antimicrobial test plate wherein certain of the wells contain growing cultures of bacteria of the type that evolve alkaline gases, which comprises: covering the wells with a porous membrane dried after having been impregnated with an approximately 10% (W/V) solution of a solid water-soluble compound selected from the group consisting of inorganic acid phosphates, the acid salts of amino acids and the polycarboxylic organic acids which are relatively non-volatile, non-hygroscopic and non-toxic to humans and bacteria.

4,701,413

METHOD OF PRODUCING INOSINE AND/OR GUANOSINE

Kenichiro Miyagawa, Ibaraki; Muneharu Doi, Takarazuka, and Shun-ichi Akiyama, Fujisawa, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 19, 1983, Ser. No. 515,260
Claims priority, application Japan, Jul. 27, 1982, 57-131664
Int. Cl.[4] C12P *19/40;* C12N *15/00, 1/20;* C12R *1/07, 1/125*
U.S. Cl. 435—88 10 Claims

1. A method of producing inosine and/or guanosine, which comprises culturing a mutant strain of the genus Bacillus, which requires adenine for growth and is resistant to an antifolate selected from the group consisting of methotrexate, aminopterin, pyrimethamine and trimethoprim and capable of producing inosine and/or guanosine, in a medium to cause the strain to elaborate and accumulate inosine and/or guanosine in culture broth and the inosine and/or guanosine so accumulated are recovered from said broth.

4,701,414

METHOD FOR PRODUCING ETHANOL FROM XYLOSE-CONTAINING SUBSTANCE

Johannes van Dijken, Geerbron 18, Pynacker, and Alexander Scheffers, Sint Jorisweg 21, Delft, both of Netherlands

PCT No. PCT/SE84/00155, § 371 Date Dec. 31, 1984, § 102(e) Date Dec. 31, 1984, PCT Pub. No. WO84/04542, PCT Pub. Date Nov. 22, 1984
PCT Filed Apr. 26, 1984, Ser. No. 694,458
Claims priority, application Sweden, May 9, 1983, 8302654
Int. Cl.[4] C12P *7/08*
U.S. Cl. 435—163 8 Claims

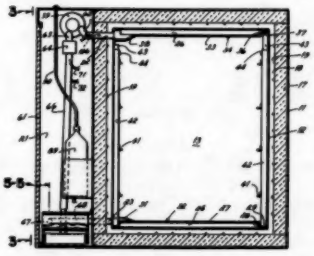
1. A method for producing ethanol from a D-xylose containing substance, comprising fermenting said substance with a yeast of the genus Pichia or its imperfect forms belonging to the genus Candida, selected from the species consisting of *Pichia stipitis, Pichia segobiensis* and *Candida shehatae,* under aerobic or anaerobic conditions to produce ethanol in a yield, in the absence of constituents severely inhibitory to the process, of at least 0.43 g. ethanol, per g. of D-xylose.

4,701,415

CONTROLLED ATMOSPHERE ENCLOSURE

Edmund L. Dutton; Glenn D. Selfridge, both of Marietta, Ohio, and Russell C. Tipton, Williamstown, W. Va., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Mar. 2, 1984, Ser. No. 585,851
Int. Cl.[4] C12M *1/36*
U.S. Cl. 435—289 28 Claims



1. A controlled atmosphere enclosure comprising:
a housing defining a controlled gas atmosphere chamber having an outlet and an inlet;
a gas recirculation path exterior to the chamber extending from the chamber outlet to the chamber inlet;
a filter in the gas recirculation path;

means for recirculating gas from the chamber outlet through the filter to the chamber inlet;
means for determining downstream from the filter, the concentration of a constituent gas of the recirculating gas;
means for adding the constituent gas to the recirculating gas in response to a control signal; and
control means, coupled to the means for determining the concentration of the constituent gas, for coupling a control signal to the constituent gas adding means to maintain a selected concentration of the constituent gas in the controlled gas atmosphere chamber,
each of said means for gas recirculation, determination and addition located totally outside of said chamber, said filter for eliminating contamination of said gas determination means and the interior of said chamber upon recirculation of said constituent gas.

4,701,416

FELINE LEUKEMIA VIRUS VACCINE PLASMIDS FOR FUSION PROTEIN OF THE GP70 ENVELOPE PROTEIN OF FELV

Jack H. Nunberg, Oakland, Calif., assignor to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 559,903, Dec. 9, 1983, abandoned. This application May 18, 1984, Ser. No. 612,003

Int. Cl.[4] C12N *1/00, 15/00*

U.S. Cl. 435—320 **1 Claim**

1. A plasmid useful in producing a fusion protein that includes an amino acid sequence of gp70 envelope protein of feline leukemia virus selected from the group consisting of:

Designation	ATCC Accession No
ptGAΔAvaI	39528
ptGAΔApaI	39529
pt9:3-19	39530.

4,701,417

CONTROL OR CALIBRATION SERUM FOR LIPID DIAGNOSIS

Rudolf Portenhauser, Tutzing, and Knut Bartl, Wilzhofen, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Nov. 21, 1985, Ser. No. 800,460

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 3445010

Int. Cl.[4] G01N *31/00*

U.S. Cl. 436—13 **9 Claims**

1. A control or calibration system for lipid diagnosis containing parameters relevant for lipid diagnosis in the normal or human pathological concentration range in a single storage-stable form, said parameters comprising 140–320 mg/dl total cholesterol, 20–80 mg/dl HDL cholesterol, 90–250 mg/dl LDL cholesterol, 70–200 mg/dl triglycerides, 50–140 mg/dl apolipoprotein A1, 20–50 mg/dl apolipoprotein A2 and 80–170 mg/dl apolipoprotein B.

4,701,418

METHOD FOR DETERMINING LIPID BOUND SIALIC ACID IN WHOLE BLOOD

Nonda Katopodis, Stamford, Conn., assignor to Dianon Systems, Inc., Stratford, Conn.

Continuation-in-part of Ser. No. 595,425, Mar. 30, 1984, abandoned. This application Mar. 18, 1985, Ser. No. 711,592

Int. Cl.[4] G01N *33/48, 33/66, 33/92*

U.S. Cl. 436—64 **46 Claims**

1. A method for extracting lipid bound sialic acid from whole blood and determining the amount of sialic acid in a sample of human whole blood which comprises the following steps:

(a) adding to a predetermined volume of a whole blood sample a sufficient combined volume of a lower alkyl alcohol and deionized distilled water to disrupt the blood cells present in the sample and to effect substantially complete dissociation of cell membrane material, the ratio of lower alkyl, alcohol to water added being such that agglomeration of said cell membrane material in the sample is avoided;

(b) mixing the resulting sample for a suitable period of time to obtain a substantially homogeneous sample;

(c) adding to the mixed sample a sufficient volume of a mixture of a lower alkyl alcohol and a chlorinated lower alkyl hydrocarbon to extract sialic acid-containing material present in the mixed sample, the ratio of total lower alkyl alcohol added in this step (c) and in step (a) to chlorinated lower alkyl hydrocarbon being such that agglomeration of said cell membrane material in the sample is avoided;

(d) mixing the resulting admixture for a suitable period of time to dissolve sialic acid-containing material present in the sample in the chlorinated hydrocarbon/lower alkyl alcohol/water admixture and to permit formation of a recoverable, substantially clear upper phase;

(e) separately recovering from the clear upper phase so formed a predetermined volume of the upper phase;

(f) adding to the predetermined volume of the upper phase an amount of a protein-precipitating agent effective to cause precipitation of sialic acid-containing materials present in the upper phase;

(g) mixing the resulting admixture;

(h) separately recovering the resulting precipitate;

(i) suspending the precipitate in a suitable volume of distilled water; and

(j) determining the amount of sialic acid present in the suspended precipitate and thereby the amount present in the blood sample.

41. A cancer diagnostic kit comprising first support means on which the test sample is to be placed; second support means onto which known amounts of reference samples and n-acetyl neuraminic acid standards have been dried; a container of a mixture of chlorinated lower alkyl hydrocarbon and lower alkyl alcohol in a 10:1 volume ratio; a container of a mixture of lower alkyl alcohol and deionized distilled water in a 2:1 volume ratio; a container of protein precipitating agent; a container of resorcinol reagent; a container of a mixture of butyl acetate and n-butanol in an 85:15 volume ratio; a container of deionized distilled water and pipette tips for the sample.

4,701,419

ANALYSIS OF POLYMERIC PROTEIN AND PROTEIN PRODUCTS

Howard R. Morris, Iver, United Kingdom, assignor to M-Scan Limited, Berkshire, England

Filed Nov. 26, 1985, Ser. No. 801,970

Claims priority, application United Kingdom, Nov. 26, 1984, 8429846

Int. Cl.[4] G01N *33/68*

U.S. Cl. 436—89 **19 Claims**

1. A method of analyzing a polymeric protein or polymeric protein product for the presence or absence of a ragged end at its C-or N-terminus, said method comprising the steps of:

(a) digesting chemically or enzymatically said polymeric protein or polymeric protein product to produce N- or C-terminus fragments which are differentiable from non-terminal fragments of te digested protein or protein product;

(b) subjecting the N- and/or C-terminus fragments obtained in step (a) to fast atom bombardment and high-mass mass spectrometry; and

(c) analyzing the mass spectrometric data obtained and checking for the presence of fragments having a mass which would be unexpected from a study of a known complete molecule of the protein or protein product which is believed to be present, whereby the presence of such unexpected fragments indicates the presence of said ragged end.

4,701,420

ANALYTICAL COMPOSITIONS, ELEMENTS AND METHODS UTILIZING REDUCTION OF FERRIC ION CHELATES TO FORM DETECTABLE DYES

Allen L. Thunberg, Pittsford, and James A. Reczek, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,301
Int. Cl.[4] C12Q *1/32*
U.S. Cl. 436—94 9 Claims

1. A dry analytical element for the determination of a reductant in a liquid, said element comprising: a support having thereon one or more coated layers, any of said layers containing any or all of

(a) a chelate of ferric ions and a ferric coordinating ligand (LIG_1) which produces ferrous ions when reduced,

(b) a ferrous ion coordinating ligand (LIG_2) which preferentially coordinates ferrous ions to form a colored complex,

(c) an electron transfer agent, and

(d) a buffer to maintain the assay pH at 6.5 or above,

and wherein all of the components (a), (b), (c), and (d) are contained in said element.

4,701,421

DETERMINATION OF PROTECTING ANTI-HBV IMMUNOGLOBULINS

Leonardus P. C. Kupers, Jv Oss, and Ludovicus F. T. Matthyssen, Ed Oss, both of Netherlands, assignors to Akzo, N.V., Arnhem, Netherlands

Filed Aug. 27, 1984, Ser. No. 644,440
Int. Cl.[4] G01N *33/543, 33/569*; A61K *39/29*
U.S. Cl. 436—518 22 Claims

1. A method for the detection or determination of immunoglobulins which provide full protection against hepatitis B infection comprising the steps of:

(a) providing a given quantity of insolubilized hepatitis B surface antigens of the antigenic type AX, wherein A represents one or more epitopes common to all hepatitis B surface antigen types, and X represents a combination of the epitopes which are not common to all hepatitis B surface antigen types;

(b) providing a given quantity of labeled hepatitis B surface antigens of the antigenic type AZ, wherein A has the same meaning given above, and Z represents a combination of the epitopes which are not common to all hepatitis B surface antigen types, and wherein said combinations X and Z do not contain any epitopes in common;

(c) contacting and incubating a sample containing the immunoglobulins to be demonstrated in a liquid medium with the components of steps (a) and (b) to form a reaction mixture having a liquid and a solid phase;

(d) separating the liquid phase from the solid phase; and

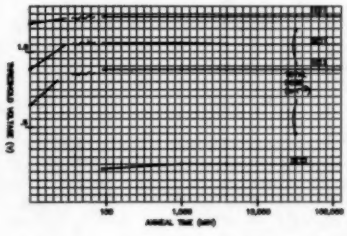
(e) detecting or determining the labeled component in the liquid and/or the solid phase, which detection or determination is a measure of the presence and/or quantity of said immunoglobulins to be detected or determined.

4,701,422

METHOD OF ADJUSTING THRESHOLD VOLTAGE SUBSEQUENT TO FABRICATION OF TRANSISTOR

Kenneth R. Elliott, Newbury Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 7, 1986, Ser. No. 848,514
Int. Cl.[4] H01L *21/265, 21/322*
U.S. Cl. 437—8 16 Claims



1. A method of adjusting the threshold voltages of field effect transistors fabricated on a III–V compound semi-insulating wafer, comprising the steps of, subsequent to the fabrication of the transistors:

measuring the threshold voltages of the transistors;

directing an ion beam at the wafer to selectively damage the channels of the transistors, thereby shifting the threshold voltages to an interim value; and

annealing the wafer at a temperature and for a time sufficient to stabilize the threshold voltages at a predetermined optimum value determined by the intensity and duration of the ion beam implanation, the annealing temperature being low enough to avoid damaging the previously fabricated transistors.

4,701,423

TOTALLY SELF-ALIGNED CMOS PROCESS

Nicholas J. Szluk, Fort Collins, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 20, 1985, Ser. No. 811,187
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—57 5 Claims

5. In a process for forming a complementary metal oxide semiconductor integrated circuit, the sequence for forming self-aligned contacts and lightly doped drain structures, comprising:

(A) forming a gate oxide layer over the n-channel and p-channel active regions of a substrate having combined contact cuts and source and drain implant cuts therethrough to the substrate;

(B) forming a layer of intrinsic silicon on the resulting structure;

(C) forming a layer of nitride over the silicon;

(D) forming a photoresist mask over the nitride covering the p-channel regions and selectively exposing the n-channel regions;

(E) etching the nitride in the presence of the photoresist mask to expose the n-channel regions and thereby define the nitride into an oxidation mask;

(F) in the presence of the photoresist mask, subjecting the structure to an n-type implant to selectively dope the

n-channel regions of the silicon layer, silicon-to-substrate contacts and n^+ source and drain regions;

(G) removing the photoresist mask and, in the presence of the nitride oxidation mask, heating the structure in an oxidizing atmosphere to selectively form an oxide implant masking layer over the exposed n-channel active regions and simultaneously partially drive-in the n^+ source and drain implanted regions;

(H) in the presence of the oxide implant masking layer, selectively subjecting the p-channel active areas to a p-type implant to dope the associated p-channel regions of the silicon layer, silicon-to-substrate contacts, and p^+ source and drain regions;

(I) removing the oxide implant masking layer;

(J) patterning the silicon layer into a selected conductor, contact and gate electrode array by:

forming an oxide etch stop layer on the silicon;

forming a nitride layer on the oxide etch stop layer;

forming a masking layer over the nitride delineating the desired silicon pattern; and

sequentially etching the nitride, oxide, and silicon to form the desired silicon pattern;

(K) using the nitride mask layer as an oxidation mask to prevent oxidation of the upper silicon surface, heating the structure in an oxidizing ambient to selectively form gate oxide sidewall spacers and simultaneously drive-in the source and drain regions and define the silicon-to-substrate contacts;

(L) selectively and alternately forming relatively lightly doped p-type and n-type LDD structures in the n-channel and p-channel regions self-aligned with the respective p^+ and n^+ source, drain and gate regions, respectively;

(M) removing the nitride masking layer; and

(N) selectively depositing a metal shunt layer on the patterned silicon array.

4,701,424

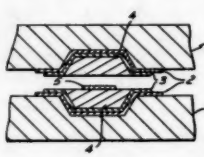
HERMETIC SEALING OF SILICON

Mati Mikkor, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 30, 1986, Ser. No. 924,712

Int. Cl.[4] H01L *7/00*

U.S. Cl. 437—209 **11 Claims**



1. A method of forming a hermetic seal between a first silicon wafer and a second silicon wafer including the steps of:

forming opposing troughs in each of said two silicon wafers;

forming an isolation layer suitable for forming a barrier between silicon and metal during heating;

forming a diffusion barrier suitable for limiting diffusion of gold;

forming a tub of polysilicon in the cavity lined by the diffusion barrier;

forming a gold strip on one of the polysilicon tubs;

positioning the two silicon wafers adjacent each other so that the gold strip on one polysilicon tub aligns with the polysilicon tub of the other wafer; and

heating the adjacent silicon wafers in a thermal gradient so as to form a silicon gold eutectic which migrates to the diffusion barrier of the silicon wafer which do not have gold film on the polysilicon tub.

4,701,425

INFRARED AND ULTRAVIOLET ABSORBING GLASS COMPOSITIONS

Rodney G. Baker, Toledo, and Daniel P. Lubelski, Rossford, both of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed May 19, 1986, Ser. No. 864,775

Int. Cl.[4] C03C *3/087, 3/078, 4/08, 4/10*

U.S. Cl. 501—70 **9 Claims**

1. A glass composition consisting essentially of the following ingredients in approximate percent by weight:

Ingredients	Percent by Weight
SiO_2	60–80
Na_2O	10–20
K_2O	0–10
CaO	5–16
MgO	0–10
Al_2O_3	0–5
SO_3	0–0.5
Fe_2O3	0.29–0.6
SnO_2	0.1–1.5
TiO_2	0.1–1.6

the composition absorbing both infrared and ultraviolet rays.

4,701,426

SILICON CARBIDE-GRAPHITE COMPOSITE MATERIAL

Akiyasu Okuno, and Masakazu Watanabe, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation-in-part of Ser. No. 558,725, Dec. 6, 1983. This application Feb. 14, 1985, Ser. No. 701,837

Claims priority, application Japan, Dec. 6, 1982, 212793

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—90 **17 Claims**

1. A silicon carbide-graphite composite material in the as sintered state which is produced by a process comprising the steps of:

adding a sintering aid to α-silicon carbide of an average grain size less than 1 μm, said sintering aid comprising not less than 0.1 wt% and less than 1.0 wt% of a compound selected from the group consisting of boron and a boron compound which includes a corresponding amount of boron; and 0.1 to 6.0 wt% of a compound selected from the group consisting of organic carbonaceous compounds which includes a corresponding amount of carbon each based on the weight of silicon carbide;

further adding carbon black to α-silicon carbide in an amount of 1 to 20 vol% based on the volume of the silicon carbide as a silicon carbide grain growth inhibitor;

blending the compositions into an intimate mixture;

molding the intimate mixture to obtain a molded body; and

sintering the molded body at about atmospheric pressure.

4,701,427

SINTERED SILICON CARBIDE CERAMIC BODY OF HIGH ELECTRICAL RESISTIVITY

Wolfgang D. G. Boecker, Lewiston; Laurence N. Hailey, Niagara Falls, and Carl H. McMurtry, Youngstown, all of N.Y., assignors to Stemcor Corporation, Cleveland, Ohio

Filed Oct. 17, 1985, Ser. No. 789,066

Int. Cl.[4] C04B *35/52, 35/56;* **B29C** *67/00;* **F22B** *9/04*

U.S. Cl. 501—92 **35 Claims**

1. An electrically insulating ceramic material comprising a sintered body composed essentially of polycrystalline, sintered silicon carbide, having between at least a portion of the silicon carbide grains thereof areas of uncombined carbon which areas contain both boron and nitrogen, and within the grains of silicon carbide, boron nitride precipitates, said sintered body having a D.C. electrical resistivity of 10^9 Ohm cm or greater at 25° C.

2. An electricity insulating ceramic material comprising a sintered body composed essentially of:
(a) up to 1.0 percent uncombined carbon;
(b) 0.3 to 1.0 percent boron;
(c) 0.03 to 0.8 percent nitrogen;
(d) and a balance of silicon carbide;
said sintered body having a density of at least 2.95 g/cm^3 and a D.C. electrical resistivity of at least 10^9 Ohm cm at 25° C.

4,701,428

CATALYST OF SILICON AND TITANIUM HAVING HIGH MECHANICAL STRENGTH AND A PROCESS FOR ITS PREPARATION.

Giuseppe Bellussi, Piacenza; Franco Buonomo, San Donato Milanese; Antonio Esposito, San Donato Milanese; Mario Clerici, San Donato Milanese; Ugo Romano, Vimercate, and Bruno Notari, San Donato Milanese, all of Italy, assignors to Enichem Sintesi S.p.A., Palermo, Italy

Filed Apr. 23, 1986, Ser. No. 854,890
Claims priority, application Italy, Apr. 23, 1985, 20457 A/85
Int. Cl.^{4} B01J *21/06, 35/08*
U.S. Cl. 502—8 **8 Claims**

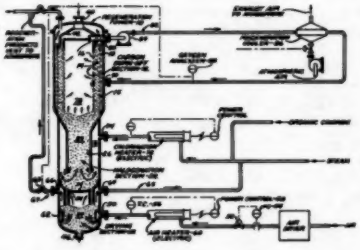
1. A silicon and titanium catalyst, in form of microspheres, comprising oligomeric silica and crystals of titanium-silicalite with an oligomeric silica/titanium-silicalite molar ratio in the range of from 0.05 to 0.11, wherein said crystals of titanium-silicalite are encaged with each other by means of Si-O-Si bridges.

4,701,429

CATALYST REGENERATION WITH VARYING AIR FLOW TO BURN-OFF ZONE FROM DRYING ZONE THROUGH HALOGENATION ZONE

Arthur R. Greenwood, Niles, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 825,296, Feb. 3, 1986, abandoned. This application Oct. 20, 1986, Ser. No. 920,556
Int. Cl.^{4} B01J *38/44, 23/96;* **C10G** *35/085*
U.S. Cl. 502—37 **5 Claims**



1. A method for effecting regeneration of spent catalyst particles used in hydrocarbon conversion reactions comprising:
(a) passing spent catalyst particles through a burn-off zone, by means of gravity, which is maintained at a coke-oxidizing temperature, wherein said catalyst is contacted with a recycle gas comprising oxygen;
(b) passing catalyst leaving said burn-off zone through a halogenation zone, by means of gravity, wherein said catalyst is contacted with a halogenation gas comprising a halogen compound;
(c) passing catalyst leaving said halogenation zone through a catalyst drying zone, by means of gravity, wherein water is removed from said catalyst;
(d) compressing an air stream drawn from the atmosphere to an elevated pressure;
(e) passing said compressed air stream, at a previously determined flow rate, through an air drying zone wherein water is removed from said air stream and heating said air stream;
(f) passing said heated and dried air stream upward through said catalyst drying zone in countercurrent contact with catalyst, thereby removing the water from the catalyst;
(g) withdrawing a first portion of the air stream emanating from said drying zone catalyst and mixing a halogen compound with it to form said halogenation gas;
(h) passing said halogenation gas into contact with catalyst in said halogenation zone;
(i) withdrawing halogenation gas from contact with said halogenation zone catalyst and mixing it with gas emanating from said burn-off zone catalyst to form said recycle gas;
(j) passing said recycle gas through the catalyst in said burn-off zone to effect combustion of coke deposits on the catalyst;
(k) withdrawing a second portion of the air stream emanating from the drying zone catalyst, where said first and second portions constitute the whole of the air stream emanating from the drying zone catalyst; and,
(l) measuring the oxygen content of said recycle gas and varying the flow rate of said second portion of the air stream emanating from the drying zone, thereby varying the amount of air supplied to the burn-off zone from the drying zone by means of the halogenation zone.

3. The method of claim 1 further characterized in that said halogenation gas is heated before it is passed into said halogenation zone.

5. The method of claim 1 further characterized in that said recycle gas is cooled before it is passed into said burn-off zone.

4,701,430

HYDROGENATION CATALYST AND METHODS FOR ITS PREPARATION AND USE TO CONVERT SILICON TETRACHLORIDE TO CHLOROSILANE AND SILANE

Il N. Jung; Ko D. Cho, both of Seoul, Rep. of Korea; John C. Lim, Claremont, Calif., and Bok-Ryul Yoo, Kyungki, Rep. of Korea, assignors to Korea Advance Institute of Science & Technology, Seoul, Rep. of Korea

Division of Ser. No. 733,883, May 14, 1985, Pat. No. 4,613,491. This application Aug. 11, 1986, Ser. No. 895,139
Claims priority, application Rep. of Korea, May 17, 1984, 2677; May 17, 1984, 2678
Int. Cl.^{4} B01J *29/06, 31/02*
U.S. Cl. 502—62 **18 Claims**

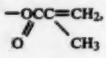
1. A catalytic composition for the disproportionation of chlorosilicon hydrides which comprises the solid reaction product of from 5 to 75 weight percent of:
(a) an active catalytic ingredient having the formula:

$$(RO)_3Si(CH_2)_n-\underset{R^2}{\overset{R^1}{N^+}}-R^3X^-$$

wherein:
n is 1 to 4;
R is alkyl having 1 to 4 carbons;
R_1 and R_2 are the same or different alkyl or aryl groups having 1 to 8 carbons;
R_3 is an alkyl- or dialkyl-amino substituted alkyl having 1 to 20 carbons, with the alkyl groups of the amino group being monovalent alkyl or heterocyclic ring having 1 to 10 carbons; and
X is chloride, iodide, or bromide; and
(b) the balance being a silicon containing carrier selected from the class consisting of: (i) a surface hydroxyl bearing solid selected from the class consisting of silica, zeolite, clay, solid silicone resin, and the hydrolyzed solid of silicon compounds having the formula:

$$R^4(CH_2)_nSiX_3$$

wherein:
n is 1 to 4;
X is halide or alkoxy having 1 to 4 carbons; and
R^4 is hydrogen, alkyl, or aryl having a functional group of the class of —SH, —CH,



pyrrolidine, and alkyl amino having 1 to 4 carbons; and (c) mixtures thereof.

4,701,431

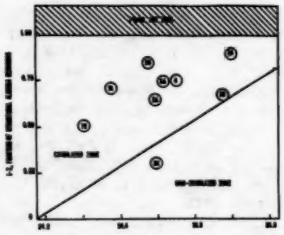
RARE EARTH STABILIZED ALUMINUM DEFICIENT ZEOLITE

Lloyd A. Pine, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 685,797, Dec. 24, 1984, abandoned, which is a division of Ser. No. 560,558, Dec. 12, 1983, abandoned. This application Apr. 10, 1986, Ser. No. 850,274

Int. Cl.[4] B01J *29/06*

U.S. Cl. 502—73 **11 Claims**



1. An aluminum deficient crystalline aluminosilicate zeolite having the crystal structure of a faujasite and having a composition, in its anhydrous state, in terms of mole ratio of oxides, as represented by the following formula:

$$(1-Z)\,(aM_2O+bR_2O+3wRE_2O_3)\,.\,(1-Z)Al_2O_3.XSiO_2$$

wherein RE represents a cation of a single rare earth metal or of a mixture of rare earth metals, wherein "w" ranges from a value of about 0.054 to about 0.217, said value w being the minimum amount of rare earth in said zeolite needed to stabilize said aluminum deficient zeolite; where R is an alkali metal cation; where M is selected from the group consisting of hydrogen ion, ammonium ion and mixtures thereof, wherein "a" ranges from zero to 1-3w; wherein "b" ranges from zero to 1-3w; wherein a+b+3w=1; wherein Z ranges from about 0.92 to 0.27, said value Z being the maximum fraction of alumina in the crystal structure that can be removed, and wherein X ranges from about 3.9 to about 54, said zeolite having a unit cell size ranging from about 24.25 to about 24.75 Angstroms, said zeolite having a unit cell size greater than the stoichiometric unit cell size when measured after heating for two hours at 1300° F., said zeolite falling within the area of FIG. 1 designated "stabilized zone".

4,701,432

SUPPORTED POLYMERIZATION CATALYST

Howard C. Welborn, Jr., Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 798,763, Nov. 15, 1985, abandoned. This application Jun. 9, 1986, Ser. No. 871,962

Int. Cl.[4] C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—113 **20 Claims**

1. An olefin polymerization supported catalyst component comprising a support treated with at least one metallocene of a Group IVB or VB metal and at least one non-metallocene compound of a Group IVB, VB, or VI transition metal.

4,701,433

PROCESS FOR IMPROVING PHOSPHORUS-VANADIUM OXIDE AND PHOSPHORUS-VANADIUM-CO-METAL OXIDE CATALYSTS

Robert C. Edwards, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 736,942, May 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 530,202, Sep. 8, 1983, abandoned. This application Aug. 26, 1986, Ser. No. 900,528

Int. Cl.[4] B01J *27/198, 27/19, 31/00;* **C07D** *307/34*

U.S. Cl. 502—209 **102 Claims**

1. A process for the improvement of a vanadium-phosphorus-oxygen catalyst having a phosphorus to vanadium atomic ratio of about 2:1 to about 0.8:1 which catalyst is present on a catalyst bed having a portion thereof containing an initial exotherm of reaction, said catalyst being suitable for use in the manufacture of maleic anhydride from a feed gas stream comprising C_4 hydrocarbons, benzene, or butane which process comprises: applying to the catalyst bed, simultaneously with introduction of said feed gas stream thereon, water and a phosphorus compound in an amount sufficient to initiate (a) deactivation of said portion of the catalyst containing the initial exotherm, and (b) formation of a new exotherm downstream in the catalyst bed from the initial exotherm, and thereafter reducing or discontinuing application of the phosphorus compound at a point in time when the initial exotherm portion of the catalyst bed is still undergoing deactivation, thereby allowing the partially deactivated exotherm portion to reactivate by producing a more isothermal catalyst bed.

4,701,434

PROMOTED NICKEL AND/OR COBALT CATALYST, ITS USE, AND PROCESS PERFORMED IN ITS PRESESNCE

Juhan Köll, Stenungsund, Sweden, assignor to Berol Kemi AB, Stenungsund, Sweden

Filed Sep. 5, 1984, Ser. No. 647,471

Claims priority, application Sweden, Sep. 9, 1983, 8304828

Int. Cl.[4] B01J *27/13, 23/40*

U.S. Cl. 502—230 **19 Claims**

1. A ruthenium-promoted, halogen-containing, nickel and/or cobalt catalyst, containing from 4–40% by weight, based on the total weight of said catalyst, of at least one metal selected from nickel and cobalt; from 0.1–5% by weight, based on the total weight of said catalyst, of ruthenium; and a porous metal oxide support comprised of at least 50% by weight of activated alumina, prepared by a process comprising:

coating said porous metal oxide support with at least one metal selected from nickel and cobalt in the form of metals or oxides;

impregnating said coated support with a solution of a ruthenium halide compound to form a catalyst intermediate;

drying said catalyst intermediate; and

reducing said ruthenium halide compound to ruthenium metal by causing said catalyst intermediate to react with hydrogen gas at an elevated temperature sufficient to reduce said ruthenium halide to ruthenium metal; and

reducing said oxide of said at least one metal selected from nickel and cobalt to metal by causing said oxide to react

with hydrogen gas at an elevated temperature sufficient to reduce said oxide to metal to provide said catalyst.

4,701,435

CATALYST AND METHOD OF PREPARATION FROM A NATURALLY OCCURRING MATERIAL

Juan J. Garcia; Roberto E. Galiasso, both of San Antonio de Los Altos; Magdalena M. Ramirez de Agudelo; Luis Rivas, both of Los Teques, and Juan Hurtado, Caracas, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Apr. 7, 1986, Ser. No. 848,682

Int. Cl.[4] B01J *21/00, 21/14, 21/16*

U.S. Cl. 502—252 **38 Claims**

1. A method for producing a catalyst for use in the hydrotreatment, hydrodemetallization and hydrocracking of heavy hydrocarbon feedstocks containing high metal levels of vanadium, nickel and sulfur comprising preparing a carrier by mixing a naturally occurring material consisting essentially of about 10 to 90% by weight magnesium silicate having a sheet-type structure, about 1.0 to 40% by weight iron and about 0.01 to 40% by weight nickel in the naturally occurring material with a catalyst component selected from the group consisting of molybdenum, cobalt, nickel, iron, tungsten copper, vanadium, chromium and mixtures thereof.

4,701,436

CATALYTIC, HOLLOW, REFRACTORY SPHERES

Taylor G. Wang, Glendale; Daniel D. Elleman, San Marino; Mark C. Lee, La Canada, and James M. Kendall, Jr., Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 602,901, Apr. 23, 1984, Pat. No. 4,576,926. This application Mar. 18, 1986, Ser. No. 841,062

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.[4] B01J *23/40, 35/08*

U.S. Cl. 502—339 **9 Claims**

1. A heterogeneous catalyst comprising hollow, spherical, gas-impervious spheres formed of a refractory compound shell containing a gas at a pressure above atmospheric and having a catalytically active surface.

4,701,437

ETHYLENE OXIDE CATALYST

Gosse Boxhoorn; Aan H. Klazinga, and Otto M. Velthuis, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 16, 1986, Ser. No. 874,924

Claims priority, application Netherlands, Jun. 28, 1985, 8501863

Int. Cl.[4] B01J *21/04, 23/04, 23/62, 23/66*

U.S. Cl. 502—348 **11 Claims**

1. A catalyst for the production of ethylene oxide from ethylene and molecular oxygen which comprises silver and an alkali metal promoter supported on a carrier, which carrier is prepared by a process which comprises mixing an aluminum compound with water and a tin compound and calcining the resultant mixture at a temperature between 1200° C. and 1700° C.

4,701,438

TREATING COMPOSITIONS FOR USED FRYING OILS

Dennis R. Taylor, and Kevin P. Gallavan, both of Pleasanton, Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 13, 1986, Ser. No. 896,041

Int. Cl.[4] B01J *20/04, 20/08, 20/12*

U.S. Cl. 502—405 **3 Claims**

1. A used frying oil or fat treating composition consisting essentially of a mixture of gel-derived alumina and acid activated bentonite or magnesium silicate, the mixture containing from about 15 to about 75% by weight of gel-derived alumina, balance acid activated bentonite or magnesium silicate.

4,701,439

YELLOW DYE-DONOR ELEMENT USED IN THERMAL DYE TRANSFER

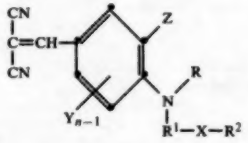
Max A. Weaver; William H. Moore, both of Kingsport, Tenn., and Kin K. Lum, Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 813,207, Dec. 24, 1985, abandoned. This application Nov. 21, 1986, Ser. No. 933,505

Int. Cl.[4] B41M *5/26*

U.S. Cl. 503—227 **19 Claims**

11. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a yellow dye dispersed in a polymeric binder and transferring a yellow dye image to a dye-receiving element to form said yellow dye transfer image, the improvement wherein said yellow dye has the formula:



wherein

R is a substituted or unsubstitued alkyl group of from 1 to about 10 carbon atoms; a cycloalkyl group of from about 5 to about 7 carbon atoms; or represents the atom which when taken together with Z forms a 5- or 6-membered ring;

R^1 is an alkylene or substituted alkylene group;

X is —OJO—, —OJ—, —JO—, —OJNR[3]—, —NR[3]J—, —NR[3]JNR[3], —JNR[3]— or —NR[3]JO—;

J is CO or SO_2;

R^3 is hydrogen; a substituted or unsubstituted alkyl group of from 1 to about 10 carbon atoms; a substituted or unsubstituted aryl group of from about 6 to about 10 carbon atoms; or represents the atoms which when taken together with R^2 forms a 5- or 6-membered ring;

R^2 is a substituted or unsubstituted alkyl group of from 1 to about 10 carbon atoms; a cycloalkyl group of from about 5 to about 7 carbon atoms; a substituted or unsubstituted aryl group of from about 6 to about 10 carbon atoms; or represents the atoms which when taken together with R^3 forms a 5- or 6-membered ring;

Z is hydrogen or represents the atoms which when taken together with R forms a 5- or 6-membered ring;

Y is a substituted or unsubstituted alkyl or alkoxy group of from 1 to about 6 carbon atoms or halogen; and

n is a positive integer from 1 to 4.

4,701,440

INSULIN DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND THEIR USE, AND PHARMACEUTICAL AGENTS FOR THE TREATMENT OF DIABETES MELLITUS

Ulrich Grau, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

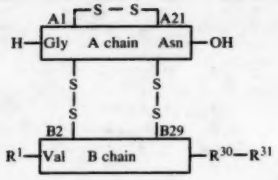
Continuation of Ser. No. 632,845, Jul. 30, 1984, abandoned. This application Jun. 6, 1986, Ser. No. 873,456

Claims priority, application Fed. Rep. of Germany, 3326472

Int. Cl.[4] A61K *37/26;* **C07K** *7/40*

U.S. Cl. 514—3 **21 Claims**

1. An insulin derivative of the formula I



(I)

in which

R^1 denotes H or H-Phe

R^{30} represents the radical of Ala, Thr or Ser and

R^{31} represents a physiologically acceptable organic group of basic character of the formula X_n-S which has up to 50 carbon atoms, in which

n is 0, 1, 2 or 3,

X represents identical or different radicals of naturally occurring neutral or basic α-amino acids and

S denotes OH or a physiologically acceptable group which blocks the carboxyl group but S being, if n is 0, a positively charged or protonatable basic radical or, if n is greater than 0, S can carry such a radical, or in which, if n is 2 or 3, the C-terminus X-S can also represent the homoserine lactone radical,

and which contains or does not contain a terminal carboxyl group or an ester or an amide thereof, and wherein, if R^1 represents H-Phe, the C-terminus —R^{30}—R^{31} cannot denote —Thr(Arg)$_m$—OH, —Ala(Arg)$_m$—OH or —Ser—(Arg)$_m$—OH, where m is 1 or 2, which has an isoelectric point between 5.8 and 8.5, or a physiologically acceptable salt thereof.

4,701,441

METHODS AND COMPOSITIONS FOR STIMULATION OF APPETITE

Satya P. Kalra, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed Feb. 11, 1985, Ser. No. 700,870
Int. Cl.[4] A61K *35/39, 37/24*
U.S. Cl. 514—12 **10 Claims**

1. A method for the stimulation of appetite in human or non-human, vertebrate animals in need of appetite stimulation or body weight gain comprising directly administering to the brain of said animal an effective appetite stimulating amount of a polypeptide designated Pancreatic Hormone III compatible with the species of said animal to which it is administered or a pharmaceutically acceptable salt or metal complex thereof.

4,701,442

TREATMENT OF SYMPTOMS OF NEOPLASTIC DISEASES WITH NUCLEOPROTEINS

Emanuel Revici, New York, N.Y., assignor to Elena Avram, New York, N.Y.

Filed Jun. 13, 1985, Ser. No. 744,341
Int. Cl.[4] C07K *15/18*
U.S. Cl. 514—21 **18 Claims**

1. A process for preparing pharmaceutical preparations of nucleoproteic material for administration to a subject for treatment of symptoms of neoplastic diseases which comprises:

immersing a carp or pig organ into a solvent for a sufficient time to extract nucleoproteins from said organ;

adding a sufficient amount of an acid to form a precipitate of nucleoproteic material;

sterilizing said nucleoproteic precipitate; and

preparing a formulation comprising a sterile water or saline suspension containing about 5 to 50% of said sterilized nucleoproteic precipitate.

4,701,443

NUTRIENT POLYESTERS

Deanna Nelson, Morton Grove, and Bruce Rowe, Chicago, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 22, 1983, Ser. No. 477,792
Int. Cl.[4] A61K *31/70;* **C07H** *13/00*
U.S. Cl. 514—23 **52 Claims**

1. A sterile, aqueous nutrient solution for intravenous administration of an effective amount, of a compound having the formula

G—[OOCACOOY]—$_n$E

wherein

G is hydrogen, the residue of a monosaccharide, a nontoxic, biologically available normal or branched chain aliphatic group containing at least one hydroxyl or hydroxyl and keto substitutent or the radical (QCOO)$_d$—Y— where QCOO— and Y are defined below and d is 1 or 2;

QCOO— is acetyl, acetoacetyl, butyryl or the residue of a nontoxic, biologically available normal or branched chain hydroxy or keto substituted aliphatic carboxylic acid having more than 4 carbon atoms;

Y is the residue of a monosaccharide, a nontoxic, biologically available normal or branched chain aliphatic group containing at least two hydroxyl substitutents;

n is from 1 to about 15; provided that when n>1, —OOCACOOY— may be the same or different;

E is hydroxyl, —OOCACOOH, or —(OOCQ)$_D$;

A is —(CH$_2$)a—C(R)(Z)(CH$_2$)$_b$C(R′)(R″)—, wherein

R is hydrogen or hydroxyl;

Z is carboxyl, —OOCACOOH, —OOCQ, hydrogen or hydroxyl; provided that were R is hydroxyl, Z is not hydroxyl, and that R and Z may be taken together to be oxy;

a is zero or an integer from 1 to about 5;

b is zero or an integer from 1 to about 5; provided that the sum of a and b is an even number or zero; and

R′ and R″ are both hydrogen, hydrogen and hydroxy or taken together, oxy;

and physiologically acceptable salts thereof.

4,701,444

TOPICAL PHARMACEUTICAL PREPARATIONS CONTAINING CHITIN SOLUBLE EXTRACT

Ester Segal, Tel-Aviv, and Nurit Lehrer, Petah Tiqua, both of Israel, assignors to Ramot University Authority for Applied Research and Development Ltd., Tel-Aviv Israel

Filed Aug. 28, 1984, Ser. No. 645,111
Int. Cl.[4] A61K *31/715*
U.S. Cl. 514—55 **4 Claims**

4. A method for treating vaginal infections caused by yeasts of the genus Candida comprising the step of

applying intravaginally a pharmaceutical composition comprising chitin soluble extract in a suitable carrier, wherein said extract contains 1 to 10 mg chitin soluble extract per milliliter of pharmaceutical carrier.

4,701,445

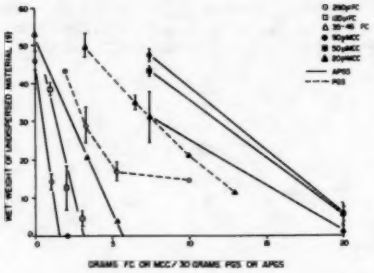
EASILY DISPERSIBLE AGGLOMERATED HYGROSCOPIC COMPOSITIONS

James J. Shull, Tucson, Ariz., assignor to Shulcon Industries, Inc., Tucson, Ariz.

Filed Jul. 12, 1984, Ser. No. 630,285
Int. Cl.[4] A61K *31/715*
U.S. Cl. 514—57 **9 Claims**

1. An easily dispersible antidiarrheal composition consisting

essentially of an admixture of an antidiarrheally effective amount of agglomerated pregelatinized starch and a dispersionally effective amount of fibrous cellulose having fibres of an average length of about 100 microns to about 290 microns.



4,701,446

PYRETHROID CONTAINING PHARMACEUTICAL COMPOSITIONS

Jose A. Arias, Mexico, Mexico, assignor to T & R Chemicals, Inc., Clint, Tex.

Filed Mar. 30, 1984, Ser. No. 595,360

Claims priority, application United Kingdom, Mar. 31, 1983, 8308974

Int. Cl.⁴ A01N *65/00, 27/00*

U.S. Cl. 514—65 **15 Claims**

1. A method of treating a parasitic disease selected from amoebiasis, malaria and trichomoniasis which comprises orally administering to a patient suffering the disease, an effective amount of a pyrethroid at a dose in the range 0.0001 mg/kg to 1 mg/kg body weight one to four times daily.

4,701,447

N-((2-NITRO)PHENYL)-N' (ORGANIC ACID) GUANIDINE ANTHELMINTICS

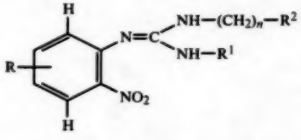
Dhiru B. Vashi, Wharton; Jeffrey N. Clark, New Egypt, and Neil A. Lindo, New Providence, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Sep. 23, 1983, Ser. No. 535,445

Int. Cl.⁴ A01N *43/54, 41/02*; C07C *141/16, 143/55*

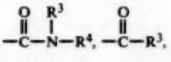
U.S. Cl. 514—85 **11 Claims**

1. A compound represented by the formula



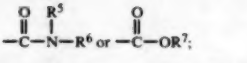
and the pharmaceutically acceptable salts thereof, wherein

R is



halogen or $-CF_3$;

R^1 is hydrogen,



R^2 is $-SO_3H$, $-OSO_3H$, $-PO_3H_2$, OR $-OPO_3H_2$;

R^3 and R^4 are independently hydrogen, loweralkyl, loweralkoxyloweralkyl, hydroxyloweralkyl, cycloloweralkyl, phenyl or substituted phenyl, benzyl or substituted benzyl (wherein there are 1, 2 or 3 substituents on the substituted phenyl or substituted benzyl independently selected from halogen, loweralkyl, loweralkoxy, halooloweralkyl, or loweralkoxyloweralkyl, or 5 or 6 membered heterocycles having 1 or 2 heteroatoms independently selected from oxygen, nitrogen and sulfur where such heterocycles are bonded to the molecule through a carbon atom;

R^5 and R^6 are independently hydrogen, loweralkyl, loweralkoxyloweralkyl, hydroxyloweralkyl, phenyl or substituted phenyl, and benzyl or substituted benzyl (wherein there are 1, 2 or 3 substituents on the substituted phenyl or substituted benzyl independently selected from halogen, loweralkyl, loweralkoxy, halooloweralkyl, or loweralkoxyloweralkyl);

R^7 is phenyl or substituted phenyl, benzyl or substituted benzyl (wherein there are 1, 2 or 3 substituents on the substituted phenyl or substituted benzyl independently selected from halogen, loweralkyl, loweralkoxy, halooloweralkyl and loweralkoxyloweralkyl); and

n is 1 to 6.

9. A method of treating helminth infestation in mammalian or avian species which comprises administering to an helminth infested animal an anthelmintically effective amount of a compound of claim 1.

4,701,448

METAL SALT OF ORGANIC PHOSPHATE AND AN ANTIHYPERLIPEMIC AGENT CONTAINING THE SAME

Akira Endo, Tokyo, and Haruyuki Yamashita, Urawa, both of Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

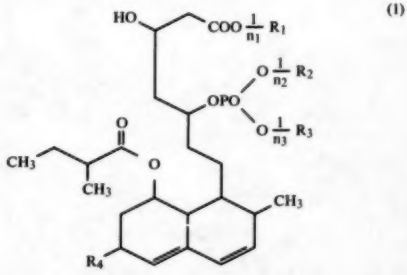
Filed Jan. 29, 1986, Ser. No. 823,762

Claims priority, application Japan, Jan. 29, 1985, 60-15120

Int. Cl.⁴ C07F *9/117, 5/06*

U.S. Cl. 514—121 **4 Claims**

3. An antihyperlipemic composition comprising an antihyperlipemic-effective amount of a metal salt of organic phosphate represented by the general formula (1):



(1)

wherein R_1, R_2 and R_3 are selected from the group consisting of hydrogen atom, alkyl group, alkali metal, alkaline earth metal, aluminum, iron, zinc, copper, nickel and cobalt, at least one of R_1, R_2 and R_3 being a metal; n_1, n_2 and n_3 are valences of R_1, R_2 and R_3, respective; R_4 is hydrogen atom or methyl group; provided that there is excluded the case where R_1 is hydrogen or methyl group, and R_2 and R_3 are hydrogen atom in admixture with a pharmaceutically acceptable excipient.

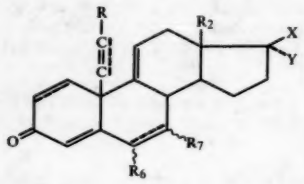
4,701,449

NOVEL 10-SUBSTITUTED STEROIDS AND THEIR USE IN THE INDUCTION OF ALDOSTERONE ANTAGONISTIC ACTIVITY

Vesperto Torelli, Maisons Alfort; Lucien Nedelec, Le Raincy; Martine Moguilewski, Nogent Sur Marne, and Anne-Marie Moura, Paris, all of France, assignors to Roussel Uclaf, Paris, France

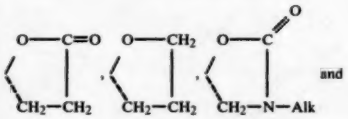
Filed Aug. 23, 1985, Ser. No. 768,867
Claims priority, application France, Aug. 24, 1984, 84 13189
Int. Cl.[4] A61K *31/585, 31/56;* C07J *1/00*
U.S. Cl. 514—175 21 Claims

1. A compound 10-substituted steroids of the formula

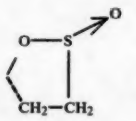


I

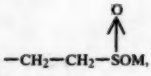
wherein R is selected from the group consisting of hydrogen, alkyl and substituted alkyl of 1 to 8 carbon atoms, alkenyl, substituted alkenyl, alkynyl and substituted alkynyl of 2 to 8 carbon atoms, aryl and substituted aryl, aralkyl and substituted aralkyl, protected hydroxy, optionally esterified carboxy, —NH_2 protected amino, mono and di-alkyl amino of 1 to 4 alkyl carbon atoms, halogen and trialkylsilyl, R_2 is methyl or ethyl, R_6 and R_7 together with the carbon atoms to which they are attached form cyclopropyl or R_6 is hydrogen and R_7 is R_1, R_1 is selected from the group consisting of hydrogen, alkyl and substituted alkyl of 1 to 6 carbon atoms, acetylthio and alkenyl, substituted alkenyl, alkynyl and substituted alkynyl of 2 to 6 carbon atoms, X is optionally acylated or etherified hydroxyl and Y is selected from the group consisting of hydrogen, R_4, —CH_2—CH_2COOM and —CH_2—CH_2—CH_2OH, M is hydrogen, alkali metal or —NH_4 or X and Y together form a member of the group consisting of



and

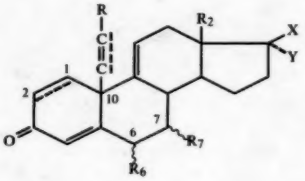


or X is —OH and Y is



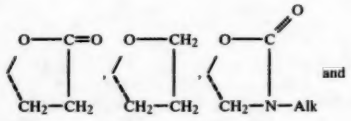
R_4 is selected from the group consisting of alkyl of 1 to 6 carbon atoms and alkenyl and alkynyl of 2 to 6 carbon atoms, Alk is alkyl of 1 to 8 carbon atoms, the dotted lines in the 1(2) and 6(7) indicate the optional presence of a second carbon-carbon bond, the dotted line in the 10-substituent indicates the optional presence of a third carbon-carbon bond, and the wavy lines at R_6 and R_7 indicate the possibility of either α or β orientation; with the proviso that when R_6 and R_7 form cyclopropyl, there is no double bond at the 6(7) position, and with the additional proviso that R is not hydrogen when R_6 and R_7 are hydrogen, R_2 is methyl, X is hydroxy or acetoxy, Y is hydrogen, the dotted lines at 1(2) and 6(7) do not represent a second bond, and the dotted line in the 10-substituent is a third carbon-carbon bond.

20. A composition for inducing aldosterone atagonistic activity comprising an effective amount of at least one compound of formula (I') and an inert pharmaceutical carrier,

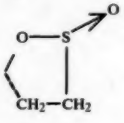


I'

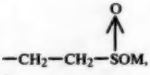
wherein R is selected from the group consisting of hydrogen, alkyl and substituted alkyl of 1 to 8 carbon atoms, alkenyl, substituted alkenyl, alkynyl and substituted alkynyl of 2 to 8 carbon atoms, aryl and substituted aryl, aralkyl and substituted aralkyl, protected hydroxy, optionally esterified carboxy, —NH_2, protected amino, mono and di-alkyl amino of 1 to 4 alkyl carbon atoms, halogen and trialkylsilyl, R_2 is methyl or ethyl, R_6 and R_7 together with the carbon atoms to which they are attached form cyclopropyl or R_6 is hydrogen and R_7 is R_1, R_1 is selected from the group consisting of hydrogen, alkyl and substituted alkyl of 1 to 6 carbon atoms, acetylthio and alkenyl, substituted alkenyl, alkynyl and substituted alkynyl of 2 to 6 carbon atoms, X is optionally acylated or etherified hydroxyl and Y is selected from the group consisting of hydrogen, R_4, —CH_2—CH_2COOM and —CH_2—CH_2—CH_2OH, M is hydrogen, alkali metal or —NH_4 or X and Y together form a member of the group consisting of



and



or X is —OH and Y is



R_4 is selected from the group consisting of alkyl and 1 to 6 carbon atoms and alkenyl and alkynyl of 2 to 6 carbon atoms, Alk is alkyl of 1 to 8 carbon atoms, the dotted lines in the 1(2) and 6(7) indicate the optional presence of a second carbon-carbon bond, the dotted line in the 10-substituent indicates the optional presence of a third carbon-carbon bond and the wavy lines at R_6 and R_7 indicate the possibility of either α or β orientation; with the proviso that when R_6 and R_7 form cyclopropyl, there is no double bond at the 6(7) position.

4,701,450

STEROIDS FOR USE AS IMMUNOMODULATORS

Jan Kelder, and Hermanus A. M. Verheul, both of Oss, Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

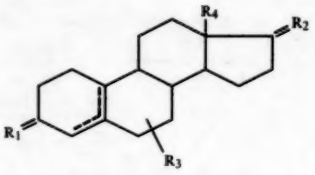
Filed Mar. 18, 1985, Ser. No. 712,438

Claims priority, application Netherlands, Mar. 21, 1984, 8400888

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—177 18 Claims

1. A method of treating auto-immune diseases in mammals suffering from auto-immune diseases, which comprises administering to the mammal a non-toxic, therapeutically effective amount of a steroid compound of the oestrane series, having the general formula



wherein

R_1=H_2, H(OR_5) or O;

R_2=(αR_6)(βOR_7);

R_3=alkyl(1–4 C) in position 6 or 7;

R_4=alkyl(1–4 C);

R_5=H or acyl(1–18 C);

R_6=H or hydrocarbyl(1–4 C);

R_7=H or acyl(1–18 C); and

the broken lines indicate the presence of a double bond in the 4,5- or 5,10-position.

4,701,451

NOVEL 6,16-DIMETHYLCORTICOIDS THEIR PREPARATION AND USE

Klaus Annen; Henry Laurent; Helmut Hofmeister; Rudolf Wiechert; Michael Toepert, and Hans Wendt, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Division of Ser. No. 515,243, Jul. 19, 1983, Pat. No. 4,555,507. This application Oct. 29, 1985, Ser. No. 777,144

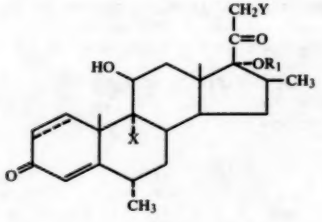
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1982, 3227312

The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/56*; C07J *1/00*

U.S. Cl. 514—180 7 Claims

1. A 6,16-dimethylcorticoid of the formula



wherein

represents a single bond or a double bond;

X is hydrogen, fluorine, chlorine, or bromine;

R_1 is (C_{1-4}-alkoxy)methyl; and

Y is chlorine, hydroxy, alkanoyloxy of 2–8 carbon atoms, or benzoyloxy.

7. A method of treating inflammation in a patient in need of such treatment comprising administering to the patient an anti-inflammatorily effective amount of a compound of claim 1.

4,701,452

USE OF CEPHEM COMPOUNDS AS IMMUNOMODULATORS

Michael Limbert, Hofheim am Taunus; Walter Dürckheimer, Hattersheim am Main; Hans-Ulrich Schorlemmer, Weimar, and Gerhard Dickneite, Marburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

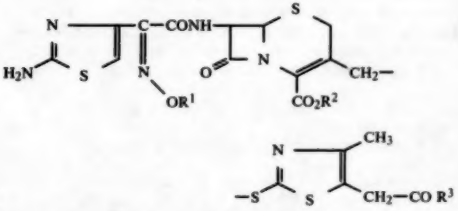
Filed Feb. 15, 1985, Ser. No. 702,319

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1984, 3405728

Int. Cl.[4] A61K *31/545*

U.S. Cl. 514—206 2 Claims

1. A method of treatment to increase the immunological responsiveness of a mammal which comprises administering to a mammal in need of said treatment an effective amount for said treatment of a compound of the formula



wherein

R^1 is hydrogen, or wherein

R^1 is alkyl with 1 to 4 carbon atoms or said alkyl substituted by halogen, hydrogen or sulfo, or wherein

R^1 is carboxymethyl or said carboxymethyl in the form of a physiologically acceptable salt or physiologically acceptable ester, or wherein

R^1 is aminocarbonylmethyl or cyanomethyl, or wherein

R^1 is carboxymethyl, carboxymethyl in the form of a physiologically acceptable salt or physiologically acceptable ester, aminocarbonylmethyl or cyanomethyl, each substituted once or twice in the methylene group by alkyl with 1 to 4 carbon atoms or having 2 alkyl substituents closed to form a 3- to 6-membered carbocyclic ring,

R^2 is hydrogen, or wherein

R^2 is a physiologically acceptable cation, or wherein

R^3 is a hydroxyl, or wherein

R^3 is alkoxy with 1 to 6 carbon atoms or said alkoxy mono- or polysubstituted by hydroxyl, halogen, carboxyl, aminocarbonyl, alkoxy with 1 to 4 carbon atoms, alkoxyalkoxy with 1 to 4 carbon atoms per alkyl moiety, alkoxyalkoxyalkoxy with 1 to 4 carbon atoms per alkyl moiety, alkyl with 1 to 4 carbon atoms, halogen, carboxyl, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl moiety or aminocarbonyl, or wherein

R^3 is alkenoxy with 2 to 6 carbon atoms or said alkenoxy mono- or polysubstituted by phenyl or said phenyl mono- or polysubstituted by alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 4 carbon atoms, halogen, carboxyl, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl moiety or aminocarbonyl, or wherein

R^3 is alkynoxy with 2 to 6 carbon atoms, or wherein

R^3 is cycloalkoxy with 3 to 6 carbon atoms, or wherein

R^3 is benzyloxy which may be substituted by halogen, alkyl with 1 to 4 carbon atoms, hydroxyl, alkoxy with 1 to 4 carbon atoms, nitro, amino, alkylamino with 1 to 4 carbon atoms, dialkylamino with 1 to 4 carbon atoms per alkyl

moiety, sulfo, aminocarbonyl, carboxyl or alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl moiety, or wherein

R^3 is aralkoxy with 1 to 6 carbon atoms in the alkyl moiety or said aralkoxy wherein the aryl moiety is mono- or polysubstituted by halogen, alkyl with 1 to 4 carbon atoms, hydroxyl, alkoxy with 1 to 4 carbon atoms, nitro, amino, alkylamino with 1 to 4 carbon atoms, dialkylamino with 1 to 4 carbon atoms per alkyl moiety, sulfo, carboxyl, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl moiety or aminocarbonyl, or wherein

R^3 is amino, or wherein

R^3 is alkylamino with 1 to 4 carbon atoms in the alkyl moiety, or wherein

R^3 is dialkylamino with 1 to 4 carbon atoms per alkyl moiety or said dialkylamino with the alkyl moieties closed to form a 4- to 7-members ring or said ring containing another nitrogen atom or an oxygen atom, or wherein

R^3 is alkenylamino with 2 to 4 carbon atoms in the alkyl moiety

and in which the R^1O group is in the syn-position.

4,701,453
SUBSTITUTED INDENO-PYRIDAZINONES

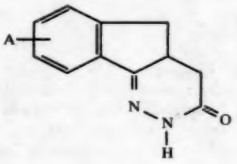
Ila Sircar, and James A. Bristol, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 575,412, Feb. 2, 1984, Pat. No. 4,602,019, which is a continuation-in-part of Ser. No. 487,780, Apr. 22, 1983, abandoned. This application Apr. 14, 1986, Ser. No. 851,763

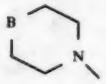
Int. Cl.[4] A61K *31/54, 31/535;* **C07D** *417/04, 413/04*

U.S. Cl. 514—222 **12 Claims**

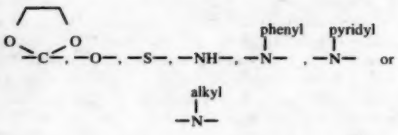
1. A compound having the structural formula



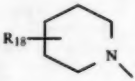
wherein A is



where B is



where alkyl is of from one to four carbon atoms;



where R_{18} is hydrogen, hydroxy, halogen, alkyl of from one to four carbon atoms, or alkoxy of from one to four carbon atoms; alkylamino of from one to four carbon atoms; or amino alkylamino of from one to four carbon atoms.

4,701,454
FUNGICIDAL COMPOSITIONS OF OXADIXYL AND ANILAZINE AND THEIR USE

Helmut Kaspers; Jiri Duben, both of Leverkusen, Fed. Rep. of Germany, and Ulrich Gisi, Wenslingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Feb. 19, 1986, Ser. No. 831,392

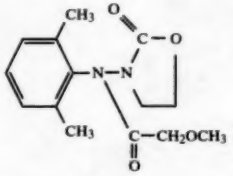
Claims priority, application United Kingdom, Feb. 19, 1985, 8504181

Int. Cl.[4] A01N *43/66, 43/76*

U.S. Cl. 514—245 **6 Claims**

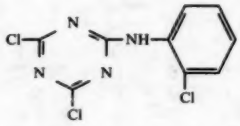
1. A method of combatting fungi in a locus, which comprises applying to the locus

(a) the compound of the formula



in association with

(b) the compound of the formula



in admixture or separately in a fungicidally effective aggregate amount, said (a) and (b) being applied in a weight ratio of said (a) to (b) in the range of from 1:2 to 1:8.

4,701,455
BIOPTERIN ANALOGS

Charles A. Nichol; John F. Reinhard, Jr., both of Durham; Gary K. Smith, Raleigh, and Eric C. Bigham, Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

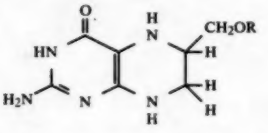
Continuation of Ser. No. 533,786, Sep. 19, 1983, abandoned. This application Jun. 21, 1985, Ser. No. 747,671

Claims priority, application United Kingdom, Jul. 12, 1983, 8318833

Int. Cl.[4] A61K *31/505;* **C07D** *475/04*

U.S. Cl. 514—249 **19 Claims**

1. A compound of formula (I)



I

wherein R represents lower alkyl groups (straight or branched) of 1–8 carbons or a pharmaceutically acceptable salt thereof.

4,701,456
AMINOALKOXYBENZOPYRANONES AS ANTIPSYCHOTIC AND ANXIOLYTIC AGENTS

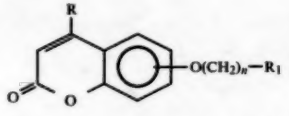
Horace A. Dewald; Lawrence D. Wise, and Thomas G. Heffner, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 651,972, Sep. 19, 1984, abandoned. This application Jun. 18, 1985, Ser. No. 745,971

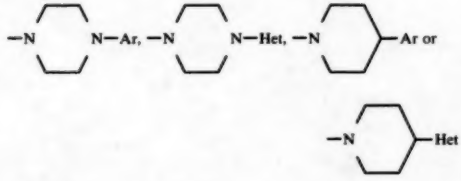
Int. Cl.[4] A61K *31/505;* C07D *405/14*

U.S. Cl. 514—253 16 Claims

10. A method of treating psychosis in a subject suffering therefrom comprising administering to said subject an effective amount of a compound of the formula



wherein n is an integer from 2–5; R is hydrogen, lower alkyl, lower alkoxy, or trifluoromethyl; R_1 is a radical of the formula



in which ═══ is a single or double-bond; Ar is phenyl or phenyl substituted by lower alkyl, lower alkoxy, lower thioalkoxy, halogen, or trifluoromethyl, and Het is 2-, 3-, or 4-pyridinyl or 2-, 3 or 4-pyridinyl substituted by lower alkyl, lower alkoxy, or halogen; 2-, 4-, or 5-pyrimidinyl or 2-, 4-, or 5-pyrimidinyl substituted by lower alkyl, lower alkoxy, or halogen; 2-pyrazinyl or 2-pyrazinyl substituted by lower alkyl, lower alkoxy, or halogen; 2- or 3-thienyl or 2- or 3-thienyl substituted by lower alkyl or halogen; 2- or 3-furanyl or 2- or 3-furanyl substituted by lower alkyl or halogen, or 2- or 5-thiazolyl or 2- or 5-thiazolyl substituted by lower alkyl or halogen, or a pharmaceutically acceptable acid salt thereof in unit dosage form.

4,701,457
AMIDINOUREAS FOR TREATING IRRITABLE BOWEL SYNDROME

John Yelnosky, Warrington, and Ghulam N. Mir, Buckingham, both of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

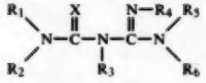
Filed Jan. 13, 1984, Ser. No. 570,620

The portion of the term of this patent subsequent to Sep. 9, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/505, 31/17, 31/19, 31/40*

U.S. Cl. 514—256 1 Claim

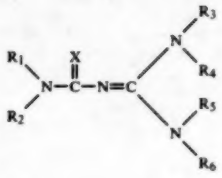
1. A method for the treatment of constipation associated with irritable bowel syndrome comprising administering to a constipated patient suffering from irritable bowel syndrome, one to eight times daily, a effective oral or parenteral anti-constipating dose of about 0.5 to about 10 mg of a compound of the formula



Formula I

-continued

or



Formula II

wherein:

x is oxygen or sulfur;

R_1, R_2, R_3, R_4, R_5 and R_6 are hydrogen, alkyl, cycloalkyl, cycloalkenyl, bicycloalkyl, alkenyl, alkynyl, alkoxy, hydroxy, holoalkyl, haloalkenyl, hydroxyalkyl, alkoxyalkyl, cyanoalkyl, aminoalkyl, mono- or dialkyl aminoalkyl, carbamoylalkyl, mono- or dialkyl carbamoyl lower alkyl, alkoxy carbamoylalkyl, acyl, alkylsufonyl, aralkylsufonyl, aryl aralkyl or R_h—$(CH_2)_n$—; wherein:

n is 0, 1, 2 or 3; and

R_h is a heterocycle selected from the group consisting of 1-pyrrole, 2-pyrrole, 3-pyrrole, 2-furan, 3-furan, 2-thiopene, 3-thiopene, 2-tetrahydrothiopene, 3-tetrahydrothiopene, 1-imidazole, 2imidazole, 4-imidazole, 5-imidazole, 2-oxazole, 4-oxazole, 5-oxazole, 2-thiazole, 4-thiazole, 5-thiazole, 1-pyrazole, 3-pyrazole, 4-pyrazole, 5-pyrazole, 1-pyrrolidine, 2-pyrrolidine, 3-pyrrolidine, 1-(3-pyrroline), 2-(3-pyrroline), 3-(3-pyrroline), 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-pyrimidine, 4-pyrimidine, 5-pyrimidine, 6-pyrimidine, 2-purine, 6-purine, 8-purine, 9-purine, 2-quinoline, 3-quinoline, 4-quinoline, 5-quinoline, 6-quinoline, 7-quinoline, 8-quinoline, 1-isoquinoline, 3-isoquinoline, 4-isoquinoline, 5-isoquinoline, 6-isoquinoline, 7-isoquinoline, 8-isoquinoline, or carbazole, where said heterocycle may be mono-, di-, tri- or tetra-substituted with ring substituents selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, aryl, lower alkynyl, aryl lower alkyl, halo, nitro, cyano, sulfonyl, hydroxyl, carboxyl, lower alkanoyl, lower alkoxy, aryl lower alkoxy, halo lower alkoxy, amido, amino, lower alkylacyloxy, lower alkylamino, lower alkoxyamino, and aryl lower alkoxyamino;

provided that at least one of R_1, R_2, R_3, R_4, R_5 and R_6 is other than hydrogen;

or a pharmaceutically acceptable salt thereof.

4,701,458
INHIBITION OF DIARRHEA INDUCED BY *ESCHERICHIA COLI* HEAT-STABLE ENTEROTOXIN

Richard N. Greenberg, Kirkwood, Mo., assignor to St. Louis University, St. Louis, Mo.

Continuation-in-part of Ser. No. 464,702, Feb. 7, 1983, Pat. No. 4,587,265. This application Feb. 7, 1985, Ser. No. 699,010

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/41, 31/195*

U.S. Cl. 514—280 6 Claims

1. The method of inhibiting diarrhea induced by *Escherichia coli* heat-stable enterotoxin comprising the administration to mammals afflicted with such diarrhea of the combination of a substantially nontoxic material constituting a source of sulfhydryl groups and an alpha-2 adrenergic receptor or berberine, said combination being administered in an effective and nontoxic amount sufficient to inhibit such diarrhea.

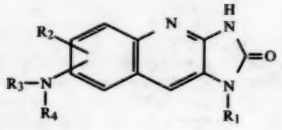
4,701,459

7-AMINO-1,3-DIHYDRO-2H-IMIDAZO[4,5-B]QUINOLIN 2-ONES AND METHOD FOR INHIBITING PHOSPHODIESTERASE AND BLOOD PLATELET AGGREGATION

Nicholas A. Meanwell, Mt. Vernon, and John J. Wright, Evansville, both of Ind., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jul. 8, 1986, Ser. No. 883,258
Int. Cl.[4] A61K *31/47*; C07D *471/04*
U.S. Cl. 514—293 **20 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, lower alkyl;

R_2 is hydrogen, lower alkyl, lower alkoxy, halogen;

R_3 is hydrogen, lower alkyl;

R_4 is hydrogen, lower alkyl, alkanoyl of 1 to 6 carbon atoms, phenylalkanoyl of 7 to 10 carbon wherein phenyl is optionally substituted with halogen, lower alkyl, or lower alkoxy;

R_3 and R_4 are joined together to form 1-morpholinyl, 1-piperidinyl or 1-pyrrolidinyl optionally substituted with $—CO_2R_5$ or

wherein R_5 is hydrogen or lower alkyl, and R_6 is hydrogen, lower alkyl, cycloalkyl of 5 to 7 carbon atoms; 1-(4-R_7-piperazinyl) wherein R_7 is $—CO_2R_8$ wherein R_8 is lower alkyl; phenyl optionally substituted with up to 2 halogen, lower alkyl or lower alkoxy; R_7 may also be phenylalkanoyl of 7 to 10 carbon atoms wherein phenyl is unsubstituted or independently substituted with up to 2 halogen, lower alkyl, lower alkoxy;

or a pharmaceutically acceptable salt thereof.

16. A method for inhibiting phosphodiesterase in a mammal which comprises administering a therapeutically effective amount of a compound of claim **1** or a pharmaceutically acceptable salt thereof.

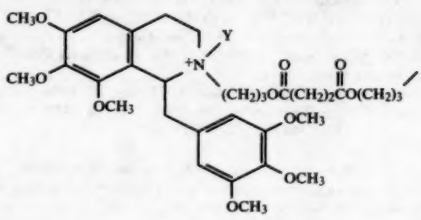
4,701,460

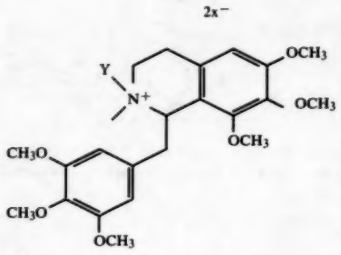
LONG DURATION NEUROMUSCULAR BLOCKING AGENTS

Hassan A. El-Sayad, Chapel Hill; Roy A. Swaringen, Jr., Durham, and David A. Yeowell, Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 217,444, Dec. 17, 1980, abandoned. This application Jan. 25, 1985, Ser. No. 694,908
Int. Cl.[4] A61K *31/47*; C07D *401/12*
U.S. Cl. 514—308 **12 Claims**

1. A compound of the formula





wherein X is a pharmaceutically acceptable anion.

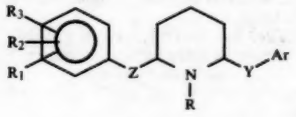
4,701,461

SUBSTITUTED CYCLIC AMINES

John T. Suh, Greenwich, Conn., and Jeffrey N. Barton, New York, N.Y., assignors to USV Pharmaceutical Corporation, Ft. Washington, Pa.

Continuation-in-part of Ser. No. 779,335, Sep. 23, 1985, abandoned, which is a division of Ser. No. 692,602, Jan. 17, 1985, Pat. No. 4,569,941, which is a continuation of Ser. No. 477,460, Mar. 11, 1983, abandoned. This application Sep. 2, 1986, Ser. No. 902,729
Int. Cl.[4] A61K *31/445*
U.S. Cl. 514—317 **4 Claims**

1. A method of anti-allergy treatment which comprises administering to a patient in need of said treatment a therapeutically effective amount for treating allergy of a composition comprising in combination with a pharmaceutically acceptable carrier a compound of the formula:

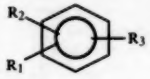


or a pharmaceutically acceptable acid addition salt thereof wherein,

Z and Y are each alkylene containing one to about five carbon atoms in the principal chain or said alkylene substituted with OH, or alkanoyloxy;

each of R_1, R_2 and R_3 is independently H, alkyl, halo, alkoxy, alkylsulfinyl, alkylmercapto, cyano, carboxy, carbolkoxy, sulfamoyl, trifluoromethyl, hydroxy, hydroxyalkyl, or lower-alkanoyloxy; or R_1 and R_2, when taken together, form a methylenedioxy or —O—CO—O—;

Ar is



wherein,
R_1, R_2 and R_3 are as herein described; and
R is H, alkyl, cycloalkyl, alkenyl, alkynyl, carbalkoxy, or $CONR_4R_5$ wherein each of R_4 and R_5 is H or alkyl;
wherein the total number of carbon atoms in each hydrocarbyl group is up to 6.

4,701,462

METHOD FOR PREVENTION OF HYPERTENSION

Michael G. Wyllie, Canterbury, United Kingdom, assignor to John Wyeth and Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 677,251, Dec. 3, 1984, abandoned. This application Mar. 31, 1986, Ser. No. 846,313
Claims priority, application United Kingdom, Sep. 11, 1984, 8422924
Int. Cl.[4] A61K *31/445*
U.S. Cl. 514—323 **1 Claim**

1. A method for lowering elevated natriuretic hormone levels in a non-hypertensive mammal, including a human, which comprises administering to a non-hypertensive mammal having an elevated natriuretic hormone level an amount of indoramin, or a pharmaceutically acceptable salt thereof, effective to lower the natriuretic hormone level.

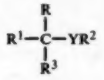
4,701,463

PYRIDYL (PYRIDYLOXY OR PYRIOLYLTHIO) AZOLOMETHANES

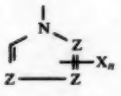
Richard B. Rogers, Concord, and Maria P. Herrero, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 653,399, Sep. 24, 1984, Pat. No. 4,636,514, Continuation of Ser. No. 407,852, Aug. 13, 1982, abandoned. This application Aug. 18, 1986, Ser. No. 897,483
Int. Cl.[4] C07D *401/14;* **A61K** *31/415*
U.S. Cl. 514—333 **4 Claims**

1. A compound corresponding to the formula



wherein
R represents hydrogen, phenyl or phenyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;
R^1 represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;
R^2 represents pyridyl or pyridyl substituted independently with from 1 to 3 bromo, chloro, fluoro, iodo, C_1–C_4 alkyl, C_1–C_4 alkoxy, NO_2, CN or CF_3 groups;
R^3 represents a 5-membered N-heterocyclic ring of the formula



wherein
each Z independently represents —CH or N and at least one of Z is N;
X is C_1–C_4 alkyl, Br, Cl, F or I and
n represents an integer of from 0 to 3 and
Y is oxygen or sulfur.

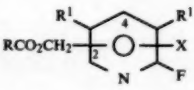
4,701,464

FLUOROPYRIDINYLMETHYL CYCLOPROPANECARBOXYLATE INSECTICIDES

Richard B. Phillips, Cranbury, N.J.; Ernest L. Plummer, Yardley, and John F. Engel, both of Washington Crossing, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

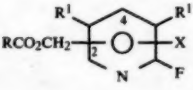
PCT No. PCT/US85/00641, § 371 Date Jun. 3, 1985, § 102(e) Date Jun. 3, 1985, PCT Pub. No. WO85/04553, PCT Pub. Date Oct. 24, 1985
Continuation-in-part of Ser. No. 599,852, Apr. 13, 1984, abandoned. This PCT application Apr. 10, 1985, Ser. No. 740,606
Int. Cl.[4] C07D *213/55;* **A01N** *43/40*
U.S. Cl. 514—345 **24 Claims**

1. A compound of the formula



in which X is hydrogen, halogen or C_{1-2}alkoxy; R is 3-(2-chloro-3,3,3-trifluoropropenyl)-2,2-dimethylcyclopropyl; 3-(2,2-dibromo- or difluoro-ethenyl)-2,2-dimethylcyclopropyl; 3-(1,2-dibromo-2,2-dichloroethyl)-2,2-dimethylcyclopropyl; or 2,2,3,3-tetramethylcyclopropyl; R^1 is hydrogen or a halogen; X is at position 2 or 4 of the pyridinyl ring; and the carboxylate group is at the other of position 2 or 4.

21. A method for controlling insects by applying to the locus where control is desired, an insecticidal effective amount of a compound of the formula



in which X is hydrogen, halogen or C_{1-2}alkoxy; R is 3-(2-chloro-3,3,3-trifluoropropenyl)-2,2-dimethylcyclopropyl; 3-(2,2-dihaloethenyl)-2,2-dimethylcyclopropyl; 3-(1,2-dibromo-2,2-dichloroethyl)-2,2-dimethylcyclopropyl; or 2,2,3,3-tetramethylcyclopropyl; R^1 is hydrogen or a halogen; X is at position 2 or 4 of the pyridinyl ring; and the carboxylate group is at the other position 2 or 4.

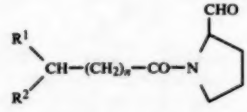
4,701,465

N-ACYLPYRROLIDINE DERIVATIVE AND SYNTHESIS AND USE THEREOF

Takaharu Tanaka; Masayuki Saitoh; Masaki Hashimoto, and Naoki Higuchi, all of Osaka, Japan, assignors to Suntory Limited, Osaka, Japan

Filed Apr. 16, 1986, Ser. No. 852,711
Claims priority, application Japan, Apr. 16, 1985, 60-80870
Int. Cl.[4] A61K *31/40;* **C07D** *207/08*
U.S. Cl. 514—423 **10 Claims**

6. A pharmaceutical composition comprising a N-acylpyrrolidine derivative of the formula (I):



(I)

wherein R^1 is hydrogen atom, a C_{1-4} alkyl group or the phenyl group, with the proviso that

when R^1 is a hydrogen atom, R^2 is phenoxy, benzoyl, the phenyl group, or a phenyl group which is mono-substituted by a halogen atom or a C_{1-4} alkoxy group, and that

when R^1 is a C_{1-4} alkyl group or the phenyl group R_2 is an aralkyl of 7–10 carbon atoms, a C_{1-4} alkyl group, the phenyl group or a phenyl group which is mono-substituted by a halogen atom or a C_{1-4} alkoxy group; or R^1 and R^2 together form an unsaturated benzylidene group or a benzylidene group which is mono-substituted by a C_{1-4} alkoxy group; and

n is an integer of 0 to 5, which N-acylpyrrolidine derivative is present in an amount effective for treating amnesia, together with a pharmaceutically acceptable carrier.

4,701,466

DIBENZ[BE]OXEPIN-ACETIC ACID DERIVATIVES, THE PREPARATION THEREOF AND THEIR APPLICATION IN THERAPY

Thomas Purcell, Montfort l'Amaury, and Lydia Zard, Gif s/Yvette, both of France, assignors to Synthelabo, Paris, France

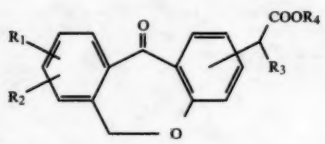
Filed Apr. 10, 1986, Ser. No. 851,114

Claims priority, application France, Apr. 11, 1985, 8505425

Int. Cl.[4] C07D *313/12;* A61K *31/335*

U.S. Cl. 514—450 **11 Claims**

1. A compound of formula (I)



in which R_1 is hydrogen or C_1–C_4 alkyl and R_2 is hydrogen, C_1–C_4 alkyl, phenylthio or phenylsulfonyl or R_1 and R_2, together with the two carbon atoms 7 and 10, form an ethano bridge or, together with the two carbon atoms 8 and 9, form a fused benzene ring, R_3 is hydrogen or methyl and R_4 is hydrogen, C_1–C_4 alkyl or the cation of a base which is acceptable in pharmacology, the group $CH(R_3)COOR_4$ being at position 2 or 3.

10. A method for treating inflammation, pain or undesirable platelet aggregation in a human or non-human mammal body comprising administering an effective, non-toxic amount of a compound of formula (I) as defined in claim **1** to a human or non-human mammal in need thereof.

4,701,467

TOLRESTAT AS ANTI-HYPERTENSIVE AGENT

Steven W. Ryder, St. James; David G. Shand, New York, and John F. Mullane, Pelham, all of N.Y., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 17, 1986, Ser. No. 853,068

Int. Cl.[4] A61K *31/275*

U.S. Cl. 514—524 **5 Claims**

1. A method for lowering blood pressure in a diabetic human in need of such treatment which comprises administering to the diabetic human an effective amount of tolrestat or a therapeutically acceptable salt thereof.

4,701,468

OXIDIZED TRIGLYCERIDES HAVING THERAPEUTIC UTILITY

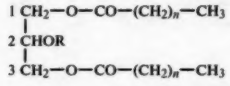
Francois Mendy, Boulogne, and Pierre Barthelemy, Barbery, both of France, assignors to Roussel-Uclaf, Paris, France

Division of Ser. No. 485,405, Apr. 15, 1983, Pat. No. 4,607,052. This application May 19, 1986, Ser. No. 864,524

Int. Cl.[4] C11C *3/00*

U.S. Cl. 514—547 **6 Claims**

1. Triglycerides of formula (I):



(I)

wherein R represents an oxidized acyl fragment of a polyunsaturated fatty acid containing 18 to 22 carbon atoms, and wherein the unsaturation is due to double bonds, and wherein n is an integer number varying from 2 to 16.

2. A method of treating a patient suffering from artherosclerosis, platelet hyperaggregation and conditions where immunomodulation is desired, which comprises administering to the patient an effective amount of the compound of claim **1**.

4,701,469

TRIGLYCERIDES, PROCESS FOR THERAPEUTICAL APPLICATIONS AND COMPOSITIONS CONTAINING THEM

Francois Mendy, Boulogne, and Pierre Barthelemy, Barbery, both of France, assignors to Roussel Uclaf, Paris, France

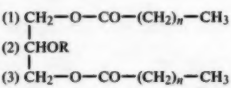
Continuation of Ser. No. 485,408, Apr. 15, 1983, Pat. No. 4,607,052. This application May 23, 1986, Ser. No. 866,258

The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.[4] C11C *3/02;* A61K *31/23*

U.S. Cl. 514—547 **6 Claims**

1. Triglycerides of formula (I):



(I)

wherein R represents a nonoxidized acyl fragment of a polyunsaturated fatty acid containing 18 to 22 carbon atoms, and wherein the unsaturation is due to double bonds, and n is 6.

4. A method of treating a patient having trouble digesting, lipids, metabolic diseases, or undernutrition which comprises administering to the patient an effective amount of the compound of claim **1**.

4,701,470

TREATMENT OF TYPE II HERPES VIRUS WITH IBUPROFEN

Jay W. Heckler, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 6, 1982, Ser. No. 447,035

Int. Cl.[4] A61K *31/19, 31/235*

U.S. Cl. 514—570 **2 Claims**

1. A process for preventing recurrent attacks of Herpes Type II virus comprising the systemic administration to a human or animal infected with Herpes Type II virus of an effective amount for preventing recurrent attacks of p-isobutylhydratropic acid or alkyl ester of from 1 to 8 carbon atoms, inclusive, including isomeric forms thereof, or a pharmacologically acceptable salt thereof.

4,701,471

SKIN CARE COMPOSITION

Joseph Loucks, Sr., deceased, late of 915 S. Center St., No. 11, and by Joseph Loucks, Jr., executor, 325 S. Henry, both of Geneseo, Ill. 61254

Filed Apr. 16, 1986, Ser. No. 852,419
Int. Cl.[4] A61K *7/48*
U.S. Cl. 514—847 **6 Claims**

1. A non-aqueous moisturizing skin care composition in the form of a topical preparation, said composition comprising approximately 42% by weight of oleic acid, and approximately 2% by weight of an emulsifier selected from the group consisting of lecithin, a palmitic acid, a stearic acid, a myristic acid, and a cis-9-palmitoleic acid.

4,701,472

EXPANDABLE POLYVINYL CHLORIDE RESIN COMPOSITION AND FOAMED SHEET PREPARED FROM THE SAME

Mamoru Koebisu, Moriyama; Takeshi Nishioka; Nario Kamijyukkoku, both of Otsu, and Hirosi Kawano, Kusatsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 888,594, Jul. 23, 1986, Pat. No. 4,663,362.
This application Feb. 24, 1987, Ser. No. 17,970
Claims priority, application Japan, Aug. 12, 1985, 60-175751
Int. Cl.[4] C08J *9/00*
U.S. Cl. 521—50.5 **9 Claims**

1. A crosslinked polyvinyl chloride resin foam sheet comprising a resin composition comprising the following resin components A, B and C as indispensable components:

A: 30 to 60 wt. % of a polyvinyl chloride resin,

B: 15 to 65 wt. % of at least one copolymer selected from the group consisting of ethylene/acrylic acid copolymers, ethylene/alkyl acrylate copolymers and ethylene/alkyl methacrylate copolymers wherein the ethylene content is in the range of about 65 to 90% and the melting point of the copolymer is in the range of about 86° to 102° C.; and

C: 5 to 50 wt. % of a polyolefin resin, in a weight ratio of (A+B)/C of at last 1.0 and the integrated ratio (R) in ^{13}C-NMR spectrum, $R=I_{56}\ I_{179}'$ of the vinyl chloride component to the unsaturated carboxylic acid component is in the range of about 2.0 to 45.

4,701,473

CATALYST FOR PRODUCING POLYURETHANE FOAMS COATED WITH SKIN

Masazumi Hasegawa; Shoji Arai, and Shinya Mizoe, all of Yamaguchi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Jun. 23, 1986, Ser. No. 877,403
Claims priority, application Japan, Jun. 27, 1985, 60-139121
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—118 **14 Claims**

1. A process for producing a polyurethane foam coated with a skin comprising forming an unfoamed skin of a polyurethane elastomer or of a vinyl chloride resin in a mold and reacting an organic polyisocyanate with a polyol and foaming with a blowing agent in the presence of a 4-methyl-1-(2-hydroxyalkyl)piperazine in the mold.

4,701,474

REDUCED REACTIVITY POLYOLS AS FOAM CONTROLLERS IN PRODUCING POLYURETHANES FOAMS

Frederick E. Bailey, Jr., Charleston, and Benny J. Argento, South Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 9, 1986, Ser. No. 849,672
Int. Cl.[4] C08L *75/00, 71/02, 63/00, 5/06*
U.S. Cl. 521—137 **38 Claims**

1. A process for producing flexible polyurethane foams wherein the foam rise is controlled without adverse effect on the resulting foam properties, said process comprising reacting and foaming in one step a reaction mixture comprising: (1) a polyol having a hydroxyl number from about 10 to about 250, (2) an organic polyisocyanate: (3) water; and (4) a foam rise controlling amount of an alkenoic acid grafted poly(alkylene oxide) polymer with a number average molecular weight of from about 1000 to about 10,000.

4,701,475

POLYURETHANES REINFORCED WITH RIGID ROD MICRO FILLERS

Robert B. Turner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 25, 1986, Ser. No. 878,451
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—137 **17 Claims**

1. A polyurethane polymer having dispersed therein elongated particles of a high-melting, rigid polymer, said particles having an average length of less than about 10 microns, in an amount sufficient to measurably increase the tensile strength and/or elongation of the polyurethane relative to a like polyurethane which is prepared in the absence of said elongated particles.

4,701,476

POLYURETHANE ELASTOMERS PREPARED FROM HIGH MOLECULAR WEIGHT PREPOLYMERS

Donald J. Burchell, Jr., Clute, and Richard D. Peffley, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1985, Ser. No. 813,893
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—159 **18 Claims**

1. In a process for preparing polyurethane and/or polyurea polymers wherein an isocyanate terminated Quasi-prepolymer is reacted with an active hydrogen-containing composition to form a polyurethane and/or polyurea polymer, the improvement comprising employing as the Quasi-prepolymer a solution of an isocyanate terminated prepolymer in a monomeric polyisocyanate, wherein said isocyanate-terminated prepolymer is the reaction product of a polyisocyanate and a relatively high equivalent weight isocyanate-reactive material, and said isocyanate-terminated prepolymer has an average molecular weight of at least twice that of said relatively high equivalent weight isocyanate-reactive material.

4,701,477

LOW VISCOSITY AROMATIC POLYOLS AND METHODS FOR THEIR PREPARATION

Milton J. Altenberg, San Francisco, and Johannes deJong, Huntington Beach, both of Calif., assignors to Chardonol, Division of Freeman Corporation, Port Washington, Wis.

Filed Jul. 13, 1983, Ser. No. 513,502
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—167 **57 Claims**

1. A method for preparing polyester-polyether polyols from polyalkylene terephthalates, which polyols are suitable for the production of polyurethanes, said method comprising:

reacting the polyalkylene terephthalate with low molecular weight polyol or polyamine solvent at a temperature of about 180° to about 230° C. to form a polyester reaction product; and

reacting the said reaction product with about 1 to about 20 molar equivalents, based on said polyalkylene terephthalate of an alkylene oxide containing 1 to 6 carbon atoms to introduce ether functionalities into the polyester molecules.

4,701,478

RADIATION CROSS-LINKABLE BINDING AGENTS

Karl Jellinek, Iserlohn-Letmathe; Bert Meier, Wesel, and Ulrich Grundke, Duisburg, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,474

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1985, 3508450

Int. Cl.[4] C08L 63/10; C08F 2/46, 283/10

U.S. Cl. 522—97 6 Claims

1. Radiation cross-linked binding agents formed by reacting first an expoxy component with more than one epoxy group per molecule with at least one carboxylic acid in a molar ratio 1 epoxy group per 0.5 to 0.9 carboxyl groups and second reacting the said first reaction product with at least one unsaturated isocyanato carbamate ester prepared by reacting a compound containing at least two isocyanate groups with an ester of an acid selected from the group consisting of acrylic acid, methacrylic acid and cyanacrylic acid containing hydroxyl groups.

4,701,479

EPOXY RESIN-BASED COMPOSITION FOR ENCAPSULATION OF SEMICONDUCTOR DEVICES

Toshio Shiobara, and Kazutoshi Tomiyoshi, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,390

Claims priority, application Japan, May 22, 1985, 60-110042

Int. Cl.[4] C08K 7/00, 3/36

U.S. Cl. 523—220 2 Claims

1. An epoxy resin-based composition for encapsulation of semiconductor devices which comprises:

(a) 100 parts by weight of a phenol-curable epoxy resin; and

(b) from 100 to 500 parts by weight of a combination of silica fillers composed of

(b-1) from 1 to 80% by weight of a quartz powder having a spherical particle form with an average particle diameter in the range from 1 to 25 μm, and

(b-2) from 20 to 99% by weight of a pulverized quartz powder with an average particle diameter in the range from 1 to 25 μm.

4,701,480

STABLE, AQUEOUS DISPERSIONS OF POLYURETHANE-UREAS

Peter H. Markusch, McMurray; James W. Rosthauser, Imperial, both of Pa., and Robin E. Tirpak, Wheeling, W. Va., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Sep. 23, 1985, Ser. No. 778,836

Int. Cl.[4] C08J 3/02; C08L 75/04

U.S. Cl. 523—340 21 Claims

1. A process for the preparation of an aqueous polyurethane-urea dispersion with improved hydrolytic stability which comprises

(a) forming an aqueous polyurethane-urea dispersion containing

(i) about 5 to 120 milliequivalents per 100 grams of polyurethane-urea of chemically incorporated anionic groups wherein at least about 50% of said anionic groups are carboxylic acid groups neutralized with volatile organic bases and

(ii) up to about 10% by weight, based on the weight of said polyurethane-urea, of lateral and/or terminal hydrophilic chains containing ethylene oxide units and

(b) converting the volatile organic base-neutralized carboxylic acid groups to non-volatile cation-neutralized carboxylate groups by adding an alkali metal salt of an organic or inorganic acid having a pKa greater than 0 to the aqueous polyurethane-urea dispersion of (a) in an amount sufficient to displace at least a portion of said volatile organic bases as the neutralizing agent for said carboxylic acid groups.

2. The process of claim 1 which comprises removing at least a portion of the volatile organic bases by distillation.

9. The process of claim 2 wherein said distillation is conducted under reduced pressure.

4,701,481

DURABLE EPOXY RESIN

Gary W. Bogan, Lake Jackson, Tex.; Peter A. Lucas, Allentown, Pa., and Georgia A. Monnerat, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 769,043, Aug. 26, 1985, abandoned. This application Oct. 30, 1986, Ser. No. 924,963

Int. Cl.[4] C08L 63/00; C08K 3/36

U.S. Cl. 523—428 19 Claims

1. In a curable composition comprising

(A) at least one filler material;

(B) at least one epoxy resin; and

(C) at least one curing agent for component (B); the improvement which comprises employing as at least a part of component (B) at least one hydrocarbon epoxy novolac resin, halogenated epoxy hydrocarbon novolac resin or combination thereof in an amount such that at least about 40 percent of the epoxy groups present in component (B) are contributed by said hydrocarbon epoxy novolac resins.

4,701,482

EPOXY RESIN COMPOSITION FOR ENCAPSULATION OF SEMICONDUCTOR DEVICES

Kunio Itoh; Toshio Shiobara; Koji Futatsumori; Kazutoshi Tomiyoshi, and Hisashi Shimizu, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 21, 1986, Ser. No. 865,416

Claims priority, application Japan, May 24, 1985, 60-111557

Int. Cl.[4] C08K 3/24, 9/06; C08L 63/00

U.S. Cl. 523—435 1 Claim

1. An epoxy resin-based composition which comprises:

(A) 100 parts by weight of a thermally curable epoxy resin;

(B) from 100 to 600 parts by weight of an inorganic filler selected from the group consisting of finely pulverized quartz, powders of fused quartz glass, synthetic silica powder, talc, mica flakes, silicon nitride, boron nitride, alumina or mixtures thereof;

(C) from 1 to 50 parts by weight of a combination composed of

(C-1) from 2% to 75% by weight of an organopolysiloxane represented by the average unit formula

$$R^1_uR^2_vSiO_{(4-u-v)/2}$$

in which R^1 is a hydrogen atom or a monovalent group selected from the class consisting of monovalent hydrocarbon groups, alkoxy groups, hydroxy group and polyoxyalkylene groups of the formula $-(-R^3-O-)_mR^4$, R^3 being an alkylene group selected from the class consisting of ethylene, propylene and butylene groups, R^4 being a hydrogen atom or a monovalent hydrocarbon group having 1 to 8 carbon atoms and m being a positive integer of 2 to 4, R^2 is a substituted monovalent hydrocarbon group having, in the substituent thereon, a functional group selected from the class consisting of epoxy, amino, hydroxy, carboxyl, mercapto, carbamoyl and carbamoylamino groups, the subscript u is a positive number and the subscript v is a positive number with the proviso that u+v is in the range from 1.90 to 2,10 inclusive, and

(C-2) from 98% to 25% by weight of a copolymer composed of the segments of a polymeric aromatic moiety free of silicon atoms and segments of an organopolysiloxane moiety; and

(D) a sufficient amount of a suitable curing agent in a proportion by weight to the epoxy resin from about 1:5 to about 2:1.

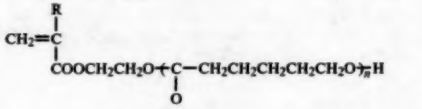
4,701,483

LACTONE-MODIFIED HYDROXYETHYL (METH) ACRYLATE SOLUTION

Kiyoshi Okitsu, Hiroshima, Japan, assignor to Daicel Chemical Industries. Ltd., Osaka, Japan

Continuation of Ser. No. 599,867, Apr. 13, 1984, abandoned. This application Dec. 6, 1985, Ser. No. 806,114
Claims priority, application Japan, Apr. 13, 1983, 58-063632
Int. Cl.[4] C08L *67/04, 67/06*
U.S. Cl. 523—500 **8 Claims**

1. A lactone-modified hydroxyethyl (meth)acrylate solution homogeneous at room temperature consisting of 30 to 95 parts by weight of a lactone-modified hydroxyethyl (meth)acrylate represented by the formula (I):



wherein R is CH_3 or H, and n is an integer of from 3 to 20 and 5 to 70 parts by weight of a solvent selected from the group consisting of toluene, xylene, and a mixture thereof.

4,701,484

ASPHALT COMPOSITIONS CONTAINING ANTI-STRIPPING ADDITIVES PREPARED FROM AMINES OR POLYAMINES AND ALDEHYDES

Dane Chang, Houston, and Duane S. Treybig, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 24, 1987, Ser. No. 17,519
Int. Cl.[4] C08L *95/00*
U.S. Cl. 524—59 **11 Claims**

1. A composition which comprises a blend of

(A) bituminous material and

(B) the product resulting from reacting at a temperature sufficient to complete the reaction

(1) at least one aldehyde; with

(2) at least one material selected from

(a) at least one organic amine;

(b) at least one organic polyamine;

(c) at least one hydrohalide salt of an organic amine;

(d) at least one hydrohalide salt of an organic polyamine; or

(e) a combination of any two or more of (a), (b), (c) or (d);

wherein components (1) and (2) are employed in quantities which provide a ratio of carbonyl groups per amine hydrogen atom of

(i) when the aldehyde is an α,β-ethylenically unsaturated aldehyde, from about 0.025:1 to about 0.6:1; and

(ii) when the aldehyde is a saturated aliphatic aldehyde, aromatic aldehyde or an unsaturated aldehyde having unreactive carbon-carbon double bonds, from aout 0.025:1 to about 1:1; and

wherein components (A) and (B) are employed in quantities which provide from about 0.05 to about 10 percent by weight of component (B) based upon the combined weight of components (A) and (B).

4,701,485

MALONATE-BASED LIGHT STABILIZERS FOR PLASTICS

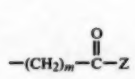
Richard V. Nelson, Wilmington, Del., and John F. Stephen, West Chester, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 786,800, Oct. 11, 1985, abandoned. This application Aug. 6, 1986, Ser. No. 893,616
Int. Cl.[4] C07D *405/14;* **C08R** *5/34*
U.S. Cl. 524—98 **17 Claims**

1. A compound of the formula I wherein

R^1 is selected from hydrogen and an alkyl group of 1–5 carbon atoms,

R^2 is selected from hydrogen, oxyl, hydroxyl, a straight or branched chain methylene linked alkyl group having from 1 to 18 carbon atoms, an alkanoyl group having 2–18 carbon atoms, an alkenoyl group having 3 to 6 carbon atoms, an alkynyl group having 3 to 6 carbon atoms, a cyanomethyl group, a 2,3-epoxypropyl group, a benzyl or an alkyl substituted benzyl group having 7–15 carbon atoms a group-$CH_2CH(OR^5)—R^6$ and a group of the formula



wherein Z is a group selected from -OR^7 and —$N(R^8)(R^9)$ when m is 1 or 0 and when m is 0, Z can be a group —CO—OR^{10}, wherein

R^5 is selected from hydrogen, a straight or branched chain methylene linked alkyl group having from 1 to 18 carbon atoms, an alkanoyl group having 2-18 carbon atoms, an alkenoyl group having 3 to 6 carbon atoms, an alkynyl group having 3 to 6 carbon atoms, a cyanomethyl group, a 2,3-expoxypropyl group, a benzyl or an alkyl substituted benzyl group having 7–15 carbon atoms,

R^6 is selected from hydrogen, an alkyl group of 1 to 16 carbon atoms and phenyl,

R^7 is selected from an alkyl group from 1 to 18 carbon atoms, a cycloalkyl group of 5–12 carbon atoms, and a group of formula II,

R^8 and R^9, same or different, are selected from hydrogen, an alkyl group having 1–18 carbon atoms, a cycloalkyl group having 5–12 carbon atoms, aryl groups having 6–10 carbon atoms and aralkyl groups having 7–15 carbon atoms, R^8 and R^9 together with the nitrogen atom to which they are attached can form a 5–7 membered ring selected from the group consisting of pyrrolidine, piperidine and homopiperidine,

R^{10} is selected from an alphatic group of 1–18 carbon atoms, phenyl and benzyl,

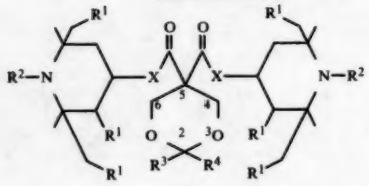
R^3 and R^4 may independently be selected from hydrogen or an alkyl group of 1–14 carbon atoms, an alkenyl group of 2–4 carbon atoms, a group —$(CH_2)_nCO—OR^{11}$ where n is 0 or 1, and a group of formula III, wherein

R^{11} is selected from an alkyl group having up to 18 carbon atoms or a group of formula II, when R^3 is hydrogen R^4 is a group of formula IV where A is a 1–4 carbon alkylene group, a phenylene group or a direct bond, when R^3 is methyl R^4 can be a group of formula V where p is 1 or 2, R^3 and R^4 together with the carbon atoms to which they are attached can form a cycloalkyl group having 5–12 atoms or denote a group of the formula VI or the group of formula VII wherein the C atom labelled 2 is the same as that labelled 2 in formula I,

X is either —O or —NR^{12}—where R^{12} is selected from hydrogen or an alkyl group of 1–8 carbon atoms wherein said formulas are:

Table of Structures

(I)



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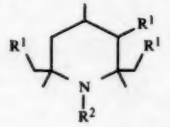

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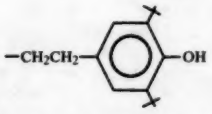

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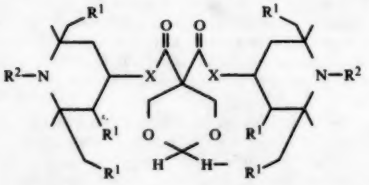

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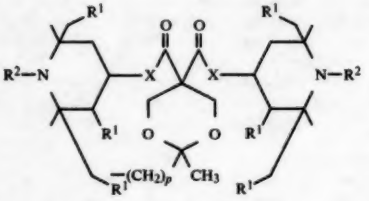

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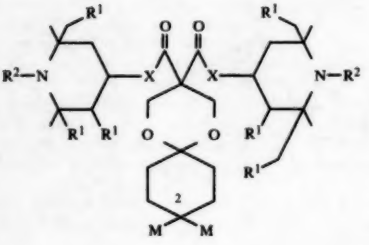

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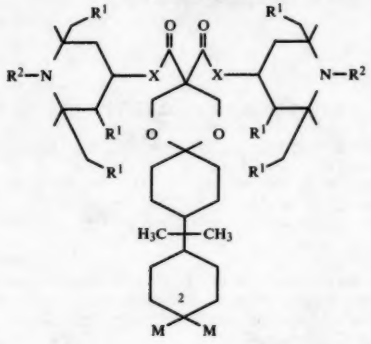
Table of Structures

(VII)



14. A synthetic polymer composition stabilized against light induced deterioration comprising an organic polymer normally subject to deterioration by light, and from 0.01-5% by weight of a compound of claim **1**.

4,701,486

STABILIZER COMPOSITIONS FOR PVC RESINS

Robert E. Bresser, Sharonville and Karl R. Wursthorn, Cincinnati, both of Ohio, assignors to Morton Thiokol, Inc., Chicago, Ill.

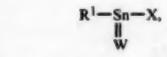
Continuation of Ser. No. 382,822, May 27, 1982, abandoned, which is a continuation of Ser. No. 238,298, Feb. 26, 1981, abandoned. This application Jan. 5, 1984, Ser. No. 568,532

Int. Cl.[4] **C08K** *5/58*

U.S. Cl. 524—182 **53 Claims**

1. A composition capable of stabilizing halogen-containing organic polymers against the deterioration effects of heat, said composition consisting essentially of the product produced by blending:

A. a mono-organotin compound or mixture of mono-organotin compounds selected from compounds having the formulas:



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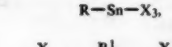

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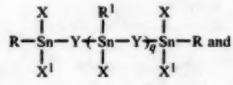

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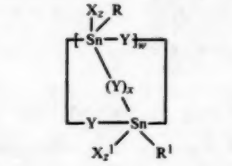


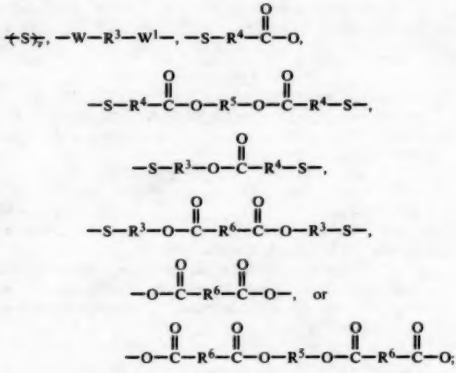
(V)

wherein

X and X^1 are the same or different and are selected from $-SR^2$,

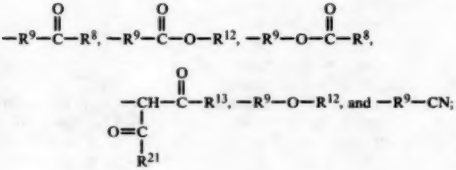
and O—R^8 with the proviso that in formula (V) when z=1 and in formulas (III) and (IV) at least one X or X^1 is —SR^2;

Y is

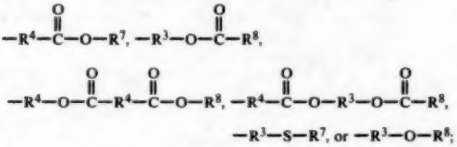


W and W^1 are the same or different and are oxygen or sulfur;

R and R^1 are the same or different and are selected from alkyl, aryl, alkenyl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl,



R^2 is alkyl, alkenyl, aryl cycloalkyl, cycloalkenyl,



R^3 is alkylene of at least 2 carbon atoms, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkenylene;

R^4 is alkylene, arylene, alkenylene of at least 2 carbon atoms, cycloalkylene, or cycloalkenylene;

R^5 is R^3;

R^6 is nothing or R^4;

R^7 is —H or R^8;

R^8 is alkyl, alkenyl, aryl, aralkyl, alkaryl, cycloalkyl, or cycloalkenyl;

R^9 is C_1 to C_4 alkylene;

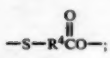
R^{12} is —H or a monovalent C_1 to C_{20} hydrocarbon radical;

R^{13} and R^{21} are the same or different and are each C_1 to C_{20} alkyl or C_1 to C_{20} alkoxy;

q=0 or an integer from 1 to 4 inclusive;

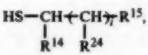
v=an integer from 1 to 8 inclusive; and

w=0, 1 or 2, x=0 or 1, z=0 or 1 with the proviso that when x=0 then z=1, when x=1 then z=0 and w=1, when w=2 then x=0 and z=1, and when w=0 then x=0, z=1 and Y is —W—R^3—W^1— or



and

B. in a synergistically effective amount, a mercaptan-containing organic compound or mixture or mercaptan-containing organic compounds selected from compounds having the formula:



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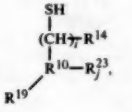

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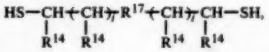

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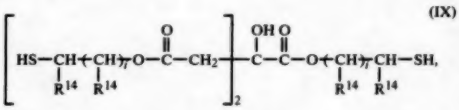

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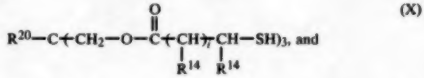

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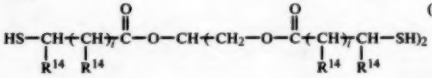


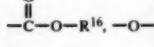
(XI)

where

R^{10} is cycloalkyl, cycloalkenyl or phenyl;

R^{14} is —H, aryl, or C_1 to C_{18} alkyl;

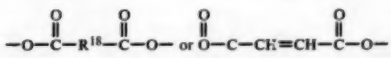
R^{15} and R^{24} are the same or different and are



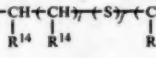
—OH, —SH, aryl, C_1 to C_{18} alkyl, or —H;

R^{16} is —H or R^8;

R^{17} is

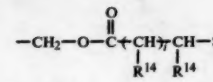


R^{18} is arylene, C_1 to C_8 alkylene, or

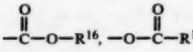


R^{19} is —H or when R^{10} is phenyl may be a divalent group which may contain halogen, hydroxy, mercapto or alkyl substituents and which combines with the phenyl to form a napthalene ring

R^{20} is —CH_3, —CH_2CH_3, or



R^{23} is



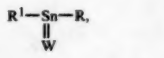
—SH, aryl, C_1 to C_{18} alkyl, —OH or —H with the proviso that in formula (VII) when R^{10} is phenyl, R^{23} is —OH and i=0, then the —OH and —SH groups are on non-adjacent carbon atoms;

i=0 or an integer from 1 to 6 inclusive;

j=0, 1, 2 or 3; and

f=1 or 2; and

C. in a synergistically effective amount, a diorganotin compound or mixture of diorganotin compounds selected from compounds having the formulas:



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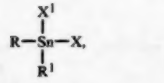

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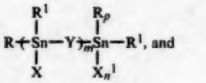

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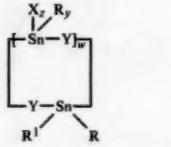


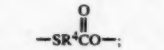
(XV)

wherein

R, R^1, W, X, X^1, Y, w and z are as previously defined;

n=0, 1 or 2, p=0, 1 or 2 with the proviso that n+p=2, and m=1 to 5;

y=1 or 2, y+z=2 with the proviso that when w=0 then Y is —W—R^3—W^1—, or



and in formula (XV) when z=1 and in formulas (XIII) and (XIV) at least one X or X^1 is —SR^2.

41. A polymer composition comprising a halogen-containing organic polymer and a stabilizingly effective amount of a stabilizer composition according to claim 1.

4,701,487

EXTRUSION PROCESSING AID COMPOSITION AND POLYOLEFIN CONTAINING SAME

John Hakim, Tulsa, Okla., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Jun. 6, 1983, Ser. No. 501,473

Int. Cl.[4] C08K *5/20;* **C08L** *23/00, 23/12, 23/20*

U.S. Cl. 524—229 **30 Claims**

1. An extrusion processing aid for polyolefins comprising an acid amide or an alkylene bis-amide of a saturated or unsaturated mono- or dicarboxylic acid, an aliphatic hydrocarbon or mixture of aliphatic hydrocarbons having a number average molecular weight of from about 400 to about 50,000 and an oxygen-containing, high density ethylene polymer having an average vapor pressure osmometer molecular weight of from about 1,000 to about 3,000.

12. Composition comprising a polyolefin and from about 0.005 to about 8% by weight of the processing aid of claim 1.

4,701,488

AMINOORGANOPOLYSILOXANE COMPOSITIONS WITH IMPROVED COMBUSTION RESISTANCE

Thomas C. Williams, Ridgefield, Conn., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 31, 1986, Ser. No. 845,987

Int. Cl.[4] C08K *5/55, 5/13, 5/09, 5/07, 5/05*

U.S. Cl. 524—266 **55 Claims**

13. A combustion-resistant heat-curable aminoorganopolysiloxane composition comprising:

(a) an aminoorganopolysiloxane polymer containing an average of at least one hydrogen atom bonded to nitrogen in at least two of the silicon-bonded primary or secondary aminoorgano groups;

(b) the reaction product of an organic polyisocyanate and a compound containing an alcoholic, phenolic, silanic or oximyl hydroxyl group or thiol group;

(c) a filler;

(d) a hydroxyl end-blocked organopolysiloxane fluid having an average molecular weight of from about 200 to about 2,000; and

(e) a combustion inhibiting amount of an additive selected from the group consisting of:

(i) a chromium compound;

(ii) an iridium compound;

(iii) a molybdenum compound;

(iv) a rhodium compound;

(v) a mixture of (I) a platinum compound and (II) a compound selected from the group consisting of a barium compound, a bismuth compound, a boron compound, a calcium compound, a chromium compound, a cobalt compound, a gallium compound, an iridium compound, a magnesium compound, a manganese compound, a molybdenum compound, a nickel compound, a palladium compound, a rhodium compound, a thorium compound, a uranyl compound, an yttrium compound, a zinc compound, a zirconium compound and a rare earth metal compound; and

(vi) a mixture of a platinum compound and a dihydrocarbylsilanediol.

4,701,489

PROCESS FOR THE PRODUCTION OF STABLE NONCORROSIVE AMORPHOUS POLYALPHAOLEFINS

Michael P. Hughes, and Brian J. Pellon, both of Odessa, Tex., assignors to El Paso Products Company, Odessa, Tex.

Filed Sep. 8, 1986, Ser. No. 904,579

Int. Cl.[4] C08K *5/13;* **C08J** *3/20*

U.S. Cl. 524—349 **5 Claims**

1. A process for preparing a stable, non-corrosive amorphous polyalphaolefin which comprises:

I. withdrawing from a polymerization zone, maintained at a temperature between about 130° F. and 175° F. and a pressure sufficient to maintain at least a portion of the monomer in liquid phase, a reactor effluent comprised of (a) unreacted monomer and (b) amorphous polyalphaolefin containing active catalyst residues comprised of aluminumalkyl and titanium halide catalyst residues in a molar ratio of Al/Ti in the range from about 50:1 to about 600:1;

II. heating the reactor effluent;

III. separating molten amorphous polyalphaolefin by flashing off monomer from the effluent;

IV. intimately contacting the molten amorphous polyalphaolefin from step (III) with steam resulting from addition of from about 3 to about 15 moles of water per mole of aluminum present in said polyalphaolefin to inactivate and to neutralize said catalyst residues present in the molten amorphous polyalphaolefin;

V. removing any excess steam not consumed in step (IV) from the molten amorphous polyalphaolefin containing the inactivated, neutralized catalyst residues of step (IV);

VI. stabilizing the molten amorphous polyalphaolefin of step (V) with a hindered phenolic antioxidant, and

VII. recovering a stable, noncorrosive amorphous polyalphaolefin containing the inactivated, neutralized catalyst residues directly from step (VI).

4,701,490

METHOD FOR STABILIZING ORGANOPOLYSILOXANES

Jürgen Burkhardt, Winhöring, and Werner Rauchberger, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed May 15, 1986, Ser. No. 863,277

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1985, 3533028

Int. Cl.[4] C07F *7/08*

U.S. Cl. 524—425 **6 Claims**

1. A method for stabilizing organopolysiloxanes against viscosity changes having the general formula

$$AO(SiR_2O)_mA,$$

where R is selected from the group consisting of hydrogen, a monovalent hydrocarbon radical and a substituted monovalent hydrocarbon radical, with the proviso that a hydrocarbon radical is bonded to each silicon atom to which the hydrogen is directly bonded; A is selected from the group consisting of hydrogen and a radical having the formula

$$-SiR_aR'_{3-a},$$

where R is the same as above; R′ is selected from the group consisting of a monovalent hydrocarbon radical and a substituted monovalent hydrocarbon radical bonded to silicon via oxygen; a is 0, 1, 2 or 3 and m is an integer having a value of at least 4, said organopolysiloxanes are obtained from the condensation and/or equilibration of organosilicon compounds having Si-bonded oxygen in the presence of phosphonitrile chlorides, which comprises contacting the phosphorus compounds present in the organopolysiloxanes with a metal compound selected from the group consisting of a metal oxide, metal hydroxide and metal carbonate, where the metal is selected from the group consisting of a divalent and trivalent metal, and thereafter separating a solid containing the metal compound and phosphorous from the organopolysiloxanes.

4,701,491

SILICONE EXTRUSION STOCK

Peter Lamont; Carl M. Monroe, and Olgerts Skostins, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 27, 1986, Ser. No. 923,466

Int. Cl.[4] C08K *3/34*

U.S. Cl. 524—493 **5 Claims**

1. A method of producing a silicone rubber stock which gives an improved extrusion, as measured by a Garvey die, consisting essentially of mixing together ingredients

(A) 100 parts by weight of polydiorganosiloxane of the formula

$$\begin{array}{c} R_2 \quad R_2 \quad R_2 \\ | \quad\quad | \\ RSi(OSi)_xOSiX \end{array}$$

where R is selected from the group consisting of methyl, ethyl, vinyl, propyl, and 3,3,3-trifluoropropyl, X is R or a hydroxyl radical, x is such that the Williams Plasticity Number is from 125 to 180, and the gel slope activity of the polydiorganosiloxane is less than 25, and

(B) from 20 to 75 parts by weight of reinforcing silica filler having a surface area of greater than 150 m^2/g and a silane surface treatment, and is hydrophobic,

to give a stock which has a Garvey rating of greater than 3.5 at an extrusion rate of 20 rpm.

4,701,492

SULFURIZED TEPA/AMIDO COMPOUNDS AS INTERFACE AGENTS FOR VULCANIZABLE ELASTOMERIC MATRICES

Joel Le Ludec, Lyons; Jean Machurat, Neuville Sur Saone; Jean-Claude Morawski, Chassieu, and Gerard Soula, Meyzieu, all of France, assignors to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Oct. 15, 1985, Ser. No. 787,067

Claims priority, application France, Oct. 12, 1984, 8415654

Int. Cl.[4] C08K *3/34;* C08L *7/00, 9/00, 9/06*

U.S. Cl. 524—493 **15 Claims**

1. A composition of matter comprising (i) a sulfur vulcanization elastomeric matrix, (ii) a reinforcing amount of a siliceous filler material therefor, (iii) an effective amount of a vulcanizing agent for said matrix, and (iv) an amount effective to reduce the cohension of the siliceous filler network of an elastomer/filler interface agent which comprises the amido reaction product of tetraethylene pentamine with an amide-forming organosulfur compound.

4,701,493

ACRYLIC MODIFIED N-ARYLMALEIMIDE COPOLYMER MOLDING COMPOSITION

Barry D. Dean, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 14, 1986, Ser. No. 885,494

Int. Cl.[4] C08L *39/04, 51/04, 55/02;* C08K *3/40*

U.S. Cl. 524—504 **22 Claims**

1. An acrylic modified styrenic/N-arylmaleimide copolymer moldable composition formed by a process which comprises the following three sequential steps:

(A) polymerizing at least one alkylacrylate monomer in the presence of at least one polyfunctional acrylate crosslinking monomer;

(B) forming a styrenic/N-arylmaleimide/1,3-diene terpolymer in the presence of the polyacrylate prepared in (A); and

(C) forming a styrenic/N-arylmaleimide copolymer in the presence of both the crosslinked polyacrylate prepared in (A) and the styrenic/N-arylmaleimide/1,3-diene terpolymer prepared in (B).

4,701,494

PROCESS FOR THE PREPARATION OF WATER-SOLUBLE VINYL SACCHARIDE POLYMERS

Teunis Graafland, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 24, 1985, Ser. No. 790,905

Claims priority, application United Kingdom, Oct. 26, 1984, 8427148

Int. Cl.[4] C08F *24/00*

U.S. Cl. 524—811 **23 Claims**

1. A process for the preparation of water soluble vinyl saccharide polymers which comprises polymerizing in water solu-

tion and in the presence of an azo free-radical polymerization initiator at least one water-soluble monovinyl saccharide monomer, wherein the saccharide portion of the monomer is a mono- or di-saccharide, at a temperature in the range of from about 10° C. to 90° C. and under the provision that the total amount of water-soluble monovinyl saccharide monomer polymerized is not greater than about 150 kilograms of monovinyl saccharide monomer per cubic meter of the water solution.

4,701,495

THERMOPLASTIC RESIN COMPOSITION

Takayuki Katto; Yasumasa Komatsu, and Zenya Shiiki, all of Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 618,663, Jun. 8, 1984, abandoned. This application Feb. 26, 1986, Ser. No. 834,122

Claims priority, application Japan, Jun. 10, 1983, 58-103919

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.[4] C08L *51/00*

U.S. Cl. 525—75 **9 Claims**

1. A thermoplastic resin composition exhibiting improved heat resistance and high impact resistance comprising:

50 to 90% by weight of a copolymer (A) obtained by copolymerization of 10 to 35% by weight of acrylonitrile, 60–85% by weight of a monomer mixture consisting of 2-isopropenylnaphthalene and α-methylstyrene, the proportion of 2-isopropenylnaphthalene being 5 to 70% by weight based on the total weight of 2-isopropenylnaphthalene and α-methyl styrene, and 0 to less than 10% by weight of a vinyl monomer, other than α-methylstyrene, acrylonitrile or 20isopropenylnaphthalene, which vinyl monomer is copolymerizable with the aforegoing monomers; and

10 to 50% by weight of a graft copolymer (B) prepared by emulsion polymerizing 15 to 50 parts by weight of a graft monomer component comprising 0 to 85% by weight of an aromatic vinyl compound, 0 to 40% by weight of a vinyl cyanide, 0 to 100% by weight of methacrylic acid alkyl ester or an acrylic acid alkyl ester, or mixtures thereof, in the presence of 50–85 parts by weight of a butadiene-containing rubber as the rubber component, provided that the sum of the rubber component and graft component is 100 parts by weight.

4,701,496

COMPOSITION FOR DRAWN FILM, COLD DRAWN FILM MADE OF SAID COMPOSITION AND PROCESS FOR MANUFACTURE OF SAID FILM

Isao Yoshimura, Hideo Hata, and Takashi Kaneko, all of Kawasaki, Japan, assignors to Asahi-Dow Ltd., Tokyo, Japan

Continuation of Ser. No. 670,678, Nov. 13, 1984, abandoned, which is a continuation of Ser. No. 457,362, Jan. 12, 1983, abandoned, which is a division of Ser. No. 213,461, Dec. 5, 1980, Pat. No. 4,499,241, which is a division of Ser. No. 949,253, Oct. 6, 1978, abandoned. This application Feb. 3, 1986, Ser. No. 825,774

Claims priority, application Japan, Oct. 11, 1977, 52-120917; Nov. 22, 1977, 52-139431; May 30, 1978, 53-63870; May 30, 1978, 53-63872

Int. Cl.[4] C08L *23/06, 23/12, 23/16, 23/20*

U.S. Cl. 525—240 **8 Claims**

1. A composition suitable to make a cold drawn film comprsing a homogenous blend of one of the specific combinations of components, namely the combinations of (A)+(B)+(C); wherein

(A) is low-density polyethylene,

(B) is an elastomer having a density of not more than 0.91 g/cm^3 and made of an ethylene-° -olefin compolymer, and

(C) is a mixture of crystalline polypropylene and crystalline polybutene-1 and the ratios of the components are such as to statisy $0.07 \leqq B/(A+B) \leqq 0.07$ and $0.07 \leqq C/(A+B) \leqq 0.8$.

4,701,497

PROCESS FOR PRODUCING NOVEL PHOTOSENSITIVE RESINS

Hajime Serizawa, Koriyama; Keizo Ogihara, Sukagawa; Kiyoshi Shimizu, Koriyama, and Susumu Harada, Tokyo, all of Japan, assignors to Nitto Boseki Co., Limited, Fukushima, Japan

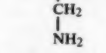
Filed Jul. 3, 1986, Ser. No. 881,919

Claims priority, application Japan, Jul. 5, 1985, 60-148036

Int. Cl.[4] C08F *271/00*

U.S. Cl. 525—292 **4 Claims**

1. A process for producing a photosensitive resin having cinnamic groups, comprising reacting a polyallylamine represented by the general formula (I)



(I)

wherein n is at least 10 or an inorganic acid salt thereof with a compound selected from the group consisting of cinnamic acid, cinnamaldehyde, cinnamic acid halide and glycidyl cinnamate in the presence of a solvent.

4,701,498

METHOD FOR THE TERMINATION OF LIVING POLYMERS OBTAINED BY ANIONIC POLYMERIZATION OF DIENIC AND/OR VINYLAROMATIC MONOMERS, AND COMPOUNDS SUITABLE TO THAT PURPOSE

Arnaldo Roggero, San Donato Milanese, and Alberto Gandini, Milan, both of Italy, assignors to Enitricerche S.p.A., Milan, Italy

Filed Jun. 24, 1986, Ser. No. 878,037

Claims priority, application Italy, Jul. 1, 1985, 21376 A/85

Int. Cl.[4] C08F *8/30*

U.S. Cl. 525—293 **6 Claims**

1. A process for the termination of living macroanions obtained by the anionic polymerization or copolymerization of diene monomers or vinylaromatic monomers or mixtures thereof comprising introducing into the polymerization mixture either batchwise or incrementally, a coupling agent selected from the group consisting of aniline-N-[cinnamylidene]; anniline-N-[crotonylidene]; butylamine-N-[cinnamylidene]; ethenamine-2-phenyl-N-[benzylidene]; 1,6-diaminohexane-N,N′-bis-[cinnamylidene]; and 1,4-p.phenylenediamine-N,N′-bis-[cinnamylidene].

4,701,499

SYNTHESIS OF N-SUBSTITUTED PEPTIDE AMIDES

Wayne D. Kornreich; Harry A. Anderson, both of San Diego; John S. Porter, Leucadia, and Jean E. F. Rivier, La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Division of Ser. No. 545,077, Oct. 24, 1983. This application Feb. 3, 1986, Ser. No. 799,339

Int. Cl.[4] C08F *8/18, 12/08, 112/08, 212/08*

U.S. Cl. 525—333.3 **8 Claims**

1. A resin for synthesizing a peptide having a substituted amide at the C-terminus thereof using solid-phase synthesis techniques, which resin comprises polystyrene that is suitably cross-linked to render it insoluble in DMF,

a plurality of the phenyl groups of the polystyrene chains of the resin having been modified to form moieties of the formuloa $-C_6H_4CH_2NHQ$ wherein Q is lower alkyl, lower fluoroalkyl, phenyl or substituted phenyl.

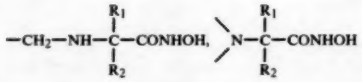
4,701,500

METAL ION BINDING PRODUCT TO INHIBIT BACTERIAL GROWTH FOR THE IMMOBILIZATION AND PURIFICATION OF BIOPOLYMERS AND THE LIKE

Jerker Porath, Bodalsvägen 4A, S-18136 Lidingö, Sweden

Filed Apr. 30, 1985, Ser. No. 729,345
Claims priority, application Sweden, May 10, 1984, 8402531
Int. Cl.[4] C08C *19/22*
U.S. Cl. 525—380 5 Claims

1. Product for adsorption of metal ions, comprising an α-amino- or α-imino-hydroxamate ligand selected from the group consisting of



and a compound ligand having at least two hydroxamate substituents in addition to at least one α-amino or α-imino group; wherein R_1 and R_2 are hydrogen or alkyl, said ligand being covalently bound to a carrier selected from the group consisting of polysaccharides, polyacrylate and silica dioxide.

4,701,501

CHIP RESISTANT PRIMER COMPOSITIONS VI'

Panagiotis I. Kordomenos, Mt. Clemens; Andrew H. Dervan, Grosse Pointe Farms, and Dennis J. Grebur, Mt. Clemens, all of Mich., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 22, 1985, Ser. No. 800,943
Int. Cl.[4] C08G *63/66;* C08L *63/02*
U.S. Cl. 525—449 20 Claims

1. A organic solvent based, thermosetting coating composition comprising:

(A) hydroxy functional epoxy ester resin having a number average molecular weight ($\overline{M}_n$) between about 1,000 and about 4,000 and being the reaction product of hydroxy functional secondary amine, in chain terminating reaction, in approximately 1 to 1 equivalent ratio with the chain extension reaction product of diepoxide with dicarboxylic acid;

(B) linear polycaprolactone diol having a molecular weight of between about 1500 and about 5000, wherein said (A) and (B) are included in said composition in a weight ratio between about 4:1 and about 1:4; and

(C) blocked polyisocyanate crosslinking agent comprising at least two isocyanate groups which have been blocked by reaction with an active hydrogen bearing blocking agent, which crosslinking agent de-blocks at the cure temperature of said composition, said crosslinking agent being present in said composition in an amount equal to between about 10 about 50 percent of the combined weight of said (A) and (B) in said composition.

4,701,502

CHIP RESISTANT PRIMER COMPOSITION V'

Panagiotis I. Kordomenos, Mt. Clemens; Andrew H. Dervan, Grosse Pointe Farms, and Dennis J. Grebur, Mt. Clemens, all of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 13, 1985, Ser. No. 808,763
Int. Cl.[4] C08G *63/06, 63/66, 63/02*
U.S. Cl. 525—449 20 Claims

1. A organic solvent based, thermosetting coating composition comprising:

(A) hydroxy functional epoxy ester resin having a number average molecular weight ($\overline{M}_n$) between about 1,000 and about 4,000, and being the reaction product of diepoxide with dicarboxylic acid in chain extension and acid component in chain termination in approximately a 1 to 1 equivalent ratio with the chain extended reaction product, said acid component comprising primary hydroxy functional acid;

(B) linear polycaprolactone diol having a molecular weight between about 1500 and about 5000, wherein said (A) and (B) are included in said composition in a weight ratio between about 4:1 and 1:4; and

(C) blocked polyisocyanate crosslinking agent comprising at least two isocyanate groups which have been blocked by reaction with an active hydrogen bearing blocking agent, which crosslinking agent de-blocks at the cure temperature of said composition, said crosslinking agent being included in said composition in an amount equal to between about 10 and about 50 percent of the combined weight of said (A) and (B) in said composition.

4,701,503

CURABLE POLYORGANOSILOXANE COMPOSITION

Norio Sato, Ohta, Japan, assignor to Toshiba Silicone Company, Ltd., Japan

Filed Jul. 19, 1985, Ser. No. 757,218
Claims priority, application Japan, Aug. 13, 1984, 59-167777
Int. Cl.[4] C08L *83/05, 83/07*
U.S. Cl. 525—478 11 Claims

1. A curable polyorganosiloxane composition comprising:

(A) 100 parts by weight of a polyorganosiloxane having at least two units represented by the following formula in the molecule:

$$(R^1)_a(R^2)_bSiO_{\frac{4-(a+b)}{2}}$$

wherein R^1 represents an alkenyl group, R^2 represents a substituted or unsubstituted monovalent hydrocarbon group containing no aliphatically unsaturated bond, a is an integer of 1 or 2, b is an integer of 0 to 2, with a+b being an integer of 1 to 3;

(B) a polyorganohydrogensiloxane having a unit represented by the following formula and also having at least 3 hydrogen atoms bonded to silicon atoms in the molecule:

$$(R^3)_cH_dSiO_{\frac{4-(c+d)}{2}}$$

wherein R^3 represents a substituted or unsubstituted monovalent hydrocarbon group, c is an integer of 0 to 2, d is an integer of 1 or 2, with c+d being an integer of 1 to 3, in an amount such that the number of hydrogen atoms bonded to silicon atoms may be from 0.5 to 4.0 per R^1 in polyorganosiloxane (A);

(C) 0.5 to 10 parts by weight of a (meth)acryl group-containing polyorganosiloxane comprising:

10 to 40 mole % of units represented by the formula:

wherein R^4 represents a hydrogen atom or a methyl group and e is an integer of 1 to 5,

10 to 60 mole % of $(CH_3)HSiO$ units,

0 to 20 mole % of $(CH_3)_2SiO$ units,

5 to 20 mole % of units represented by the formula:

$(R^5)_3SiO_{\frac{1}{2}}$

wherein R^5 represents an alkyl group having 1 to 4 carbon atoms or a phenyl group, and

10 to 50 mole % of units represented by the formula:

$R^6SiO_{3/2}$

wherein R^6 represents an alkyl group having 1 to 4 carbon atoms or a phenyl group; and

(D) 1 to 100 ppm in terms of platinum atoms based on polyorganosiloxane (A) of a catalyst selected from the group consisiting of platinum and platinum compounds.

4,701,504

REDUCTION OF ISOMERIZATION IN SOLUTION PROCESS FOR POLYMERIZATION OF ALPHA-OLEFINS

David J. Mitchell, and Vaclav G. Zboril, both of Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Jan. 23, 1986, Ser. No. 824,354

Int. Cl.[4] C08F *2/42, 6/06, 6/10*

U.S. Cl. 526—83 **13 Claims**

1. A solution polymerization process for the preparation of high molecular weight polymers of alpha-olefins selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and a C_4–C_{12} alpha-olefin, said process comprising feeding monomer selected from the group consisting of ethylene and mixtures of ethylene and at least one C_4–C_{12} alpha-olefin, a coordination catalyst and inert hydrocarbon solvent to a reactor, said catalyst containing halogen and alkyl radicals and being a titanium-based and/or vanadium-based coordination catalyst, polymerizing said monomer at a temperature of up to 320° C. and a pressure of less than 25 MPa, deactivating the catalyst in the solution so obtained by sequentially admixing therewith (a) a minor amount of a nitrogenous base followed by (b) a solution of a nonstoichiometric salt of an alkaline earth metal or zinc with aliphatic monocarboxylic acid dissolved in hydrocarbon solvent compatible with the solvent used in the polymerization process, said nitrogenous base being of the formula $NR^1R^2R^3$, where R^1, R^2, and R^3 are indpendently selected from the group consisting of H, saturated alkyls having 1–20 carbon atoms and $—SiR^4R^5R^6$, where each of R^4, R^5 and R^6 is independently selected from saturated alkyls having 1–20 carbon atoms, with the proviso that the nitrogenous base does not contain more than two $—SiR^4R^5R^6$ groups, separating the hydrocarbon solvent and other volatile matter from the resultant solution and recovering a composition comprisng said high molecular weight polymer, the amount of the nitrogenous base being not more than 2.5 moles of nitrogenous base per mole of halogen plus alkyl radical in the coordination catalyst.

4,701,505

PROCESS FOR PRODUCTION OF OLEFIN POLYMERS

Masaki Fujii; Takao Sakai, both of Yokkaichi; Hideo Sakurai, Kuwana, and Yosiharu Yamamoto, Mie, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Sep. 23, 1985, Ser. No. 778,797

Claims priority, application Japan, Sep. 26, 1984, 59-201348; Dec. 18, 1984, 59-267265

Int. Cl.[4] C08F *4/64, 10/06*

U.S. Cl. 526—125 **2 Claims**

1. A process for producing propylene polymers which comprises contacting propylene with a catalyst thereby to polymerize the propylene, said catalyst comprising:

(A) a solid catalyst component comprising as essential components a substantially anhydrous magnesium halide, titanium tetrachloride or titanium trichloride and an ester or an acid halide as electron donor,

(B) a trialkylaluminum compound, and

(C) an ether compound represented by the formula: $R^1R^2R^3C(OR^4)$ or $R^1R^2C(OR^4)_2$ wherein, R^1 stands for an aromatic or alicyclic hydrocarbon group having 6 to 12 carbon atoms, and each of R^2, R^3 and R^4 stands for a hydrocarbon group having 1 to 7 carbon atoms, and the molar ratio of the ether compound added to the organoaluminum compound (B) being in the range of 0.02 to 0.5, and the molar ratio of the electron donor to the titanium tetrachloride or titanium trichloride is approximately 0.05 to 2.0.

4,701,506

POLYMERIZATION CATALYST, PRODUCTION AND USE

Agapios K. Agapiou, Humble; Michael E. Muhle, Kingwood, and Myron B. Kurtzman, Houston, all of Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 759,202, Jul. 26, 1985, Pat. No. 4,618,596. This application Jul. 30, 1986, Ser. No. 892,154

Int. Cl.[4] C08F *4/62, 4/64, 4/68*

U.S. Cl. 526—128 **21 Claims**

1. A process for the polymerization of ethylene; alpha-olefins having from 3 to 20 carbon atoms; or mixtures of ethylene with other alpha-olefins or diolefins comprising polymerizing in the presence of a catalyst system comprising

(a) an organoaluminum compound of the formula $AlR'''_nX'''_{3-n}$ wherein R''' is hydrogen or hydrocarbyl, X''' is halogen, and n is a number from 1 to 3; and

(b) a transition metal-containing catalyst component comprising the solid reaction product obtained by treating an inert solid support material in an inert solvent sequentially with

(A) Cl_2, Br_2 or an interhalogen,

(B) an organometallic compound of a Group IIa, IIB or IIIa metal wherein all the metal valences are satisfied with a hydrocarbyl group,

(C) an oxygen-containing compound selected from ketones, aldehydes, alcohols, siloxanes, or mixtures thereof,

(D) at least one transisiton metal compound of a Group IVb, Vb, VIb, or VIII metal, and

(E) pre-reducing the transistion metal-containing component with an organometallic compound of a Group IIa, IIb or IIIa metal, with the proviso that the inert support is first contacted with (A), and the (B) and (C) ingredients can be added to the inert solid

(i) simultaneously,

(ii) as the reaction product of (B) and (C), or

(iii) treatment of the inert solid with (C) immediately precedes treatment with (B).

4,701,507

PROCESS FOR THE INCORPORATION OF FUNCTIONALIZED MONOMERS

Robert D. Mate, Stow; Dane K. Parker, Massillon, and James C. Blackwell, Tallmadge, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 2, 1986, Ser. No. 869,476

Int. Cl.[4] C08F *2/24*

U.S. Cl. 526—208 **6 Claims**

1. A process for forming a polymer comprising the aqueous emulsion polymerization of:

(A) at least one functionalized monomer that contains a polymerizable vinyl group; with

(B) at least one copolymerizable conjugated diene monomers selected from the group consisting of butadiene-1,3, 2-chlorobutadiene-1,3, isoprene, piperylene and conjugated hexadienes; and optionally

(C) at least one vinyl monomer selected from the group consisting of styrene, α-methylstyrene, divinylbenzene, vinyl chloride, vinyl acetate, vinylidene chloride, methyl methacrylate, ethyl acrylate, vinylpyridine, acrylonitrile, methacrylonitrile, methacrylic acid and acrylic acid;

the ratio of functionalized monomer to conjugated diene to vinyl monomer can range from 5:75:20 to 95:5:0 parts per hundred based on total monomers

the improvement comprising polymerizing the monomers in the presence of from 8 to 30 parts of an ionic soap per 100 parts of total organic components, (monomers and

cosolvents) and 40–80 parts of MIBK based on 100 parts of total monomers.

4,701,508

SOLVENT SOLUBLE FLUORINE-CONTAINING POLYMER, COATING COMPOSITION CONTAINING THE SAME AND COATING PROCESS THEREOF

Shirou Homma; Takashi Izumi, and Sakae Murakami, all of Yamaguchi, Japan, assignors to Mitsui Sekiyu Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1985, Ser. No. 808,241

Claims priority, application Japan, Dec. 14, 1984, 59-263017; May 13, 1985, 60-99688; May 28, 1985, 60-113075; May 30, 1985, 60-115425; Nov. 11, 1985, 60-250939

Int. Cl.⁴ C08F *14/18*

U.S. Cl. 526—249 **7 Claims**

1. A solvent soluble fluorine-containing polymer which is:

(i) a copolymer consisting essentially of

(a) a fluoroolefin having 2 to 3 carbon atoms,

(b) a vinyl ether selected from the group consisting of alkyl vinyl ether and cycloalkyl vinyl ethers, and

(c) an organosilicon compound in which the organo portion of the molecule is a hydrocarbon containing unsaturated double bonds and which compound contains a hydrolyzable group,

(ii) said copolymer comprising, based on the total mole number of said (a)–(c) in the copolymer, 30–70 mol% of (a), 20–60 mol% of (b) and 1–25 mol% of (c), and

(iii) said copolymer having a number average molecular weight (mn) of 3,000–200,000 as measured by gel permeation chromatography.

4,701,509

N-VINYL CAPROLACTAM-CONTAINING HOT MELT ADHESIVES

Robert L. Sun, Stanhope, and James F. Kenney, Mendham, both of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Sep. 17, 1984, Ser. No. 650,953

Int. Cl.⁴ C08F *26/08*

U.S. Cl. 526—264 **8 Claims**

1. A hot melt pressure-sensitive adhesive, suitable for medical use, consisting of a polymerized composition of 20 to 80 percent 2-ethylhexyl acrylate, 0 to 45 percent n-butyl acrylate, 15 to 25 percent isobutyl methacrylate and 10 to 25 percent N-vinyl caprolactam.

4,701,510

POLYCYCLOOLEFINS RESISTANT TO SOLVENTS

Robert J. Minchak, Parma Heights, and Parley C. Lane, Jr., Cuyahoga Falls, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Filed Dec. 16, 1985, Ser. No. 809,685

Int. Cl.⁴ C08F *32/06*

U.S. Cl. 526—283 **18 Claims**

1. Process for preparing a crosslinked polymer comprising the step of polymerizing a monomer charge comprising at least one cycloolefin monomer containing at least one norbornene group in the presence of a metathesis catalyst system and 0.0005 to 0.01 mole per mole of said monomer charge of a crosslinker selected from cycloolefin monomers containing two or more norbornene groups at least two of which are located at terminal or pendant positions of the molecule with at least one double bond in each of the norbornene groups, and mixtures of such crosslinkers; said crosslinked polymer has a swelling index of less than about 10 in toluene.

4,701,511

METHOD OF MAKING DIGLYME SOLUBLE SILOXANE-IMIDE COPOLYMERS

Vivian B. Valenty, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Oct. 19, 1984, Ser. No. 663,003

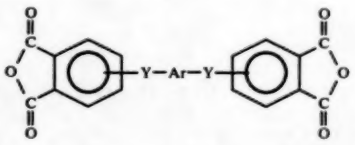
Int. Cl.⁴ C08G *77/06*

U.S. Cl. 528—26 **15 Claims**

1. A process for making random siloxane-imide copolymers in situ consisting essentially of:

(a) heating a mixture of diglyme, azeotropic solvent, organic diamine and bis-alkylamino-terminated polydiorganosiloxane to reflux, and

(b) adding to the refluxing mixture of (a) an organic dianhydride of the formula



where Ar is an aromatic or aromatic containing group and Y is oxygen or sulfur.

4,701,512

ISOCYANATE ADDUCTS WITH BENZOXAZOLONES OR BENZOXAZINEDIONES AND USE THEREOF AS LATENT CHAIN EXTENDERS OR CROSS-LINKERS FOR EPOXIDES

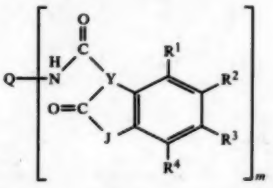
Theodore L. Parker, Lafayette, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 29, 1985, Ser. No. 792,384

Int. Cl.⁴ C08G *71/04*

U.S. Cl. 528—45 **26 Claims**

1. The compounds of the formula

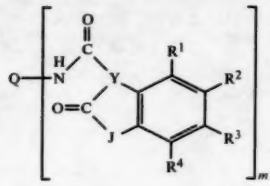


(I)

wherein Q is a mono- or polyvalent, non-interfering radical; independently in each occurrence, Y is an >N— or

group, J is O or S, each of R^1, R^2, R^3 and R^4, is H or a non-interfering substituent, of which any adjacent pair may constitute an alkylene, alkenylene or alkadienylene group of 3 or 4 carbons, and m is 2 or 3.

12. A process for preparing a latently curable epoxy resin system, said system comprising a blocked isocyanate which is dispersed throughout the rest of said system or constitutes a continuous, separate phase in contact with and dispersible therein, said blocked isocyanate being a compound of the formula



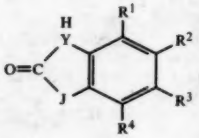
(1)

wherein Q is a mono- or polyvalent, non-interfering radical; independently in each occurrence, Y is an >N— or

group, J is O or S, each of R^1, R^2, R^3 and R^4, is H or a non-interfering substituent, of which any adjacent pair may constitute an alkylene, alkenylene or alkadienylene group of 3 or 4 carbons, and m is 2 or 3,
and said process comprising either
(1) reacting an isocyanate of the formula

$$Q—NCO)_m \quad (2)$$

with a benzoxazolone or benzoxazinedione of the formula



(3)

in the presence of said resins, or
(2) carrying out said reaction in the absence of said resin and then bringing together said compound and said resin.

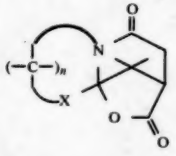
4,701,513

NOVEL EPOXY HARDENERS

Shiow C. Lin, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Dec. 15, 1986, Ser. No. 941,864
Int. Cl.[4] C08G *59/44*
U.S. Cl. 528—89 **5 Claims**

1. A thermosettable composition comprising an epoxy resin and 0.1 to 99.9% by weight of the epoxy resin of an epoxy hardener of the formula:



wherein n is 2 to 4 and X is —O—, —S— or

wherein R_1 is an aliphatic or aromatic moiety.

4,701,514

DIFUNCTIONALIZED POLYARYLENE POLYETHERS AND PROCESS FOR PREPARATION THEREOF

Virgil Percec, Shaker Heights, Ohio, assignor to B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 586,678, Mar. 6, 1984, Pat. No. 4,562,243.
This application Dec. 30, 1985, Ser. No. 814,747
Int. Cl.[4] C08G *65/48, 75/23*
U.S. Cl. 528—174 **23 Claims**

1. A difunctionalized substantially linear crosslinkable thermoplastic polyarylene polyether oligomer, or polyarylene polythioether (PAPE) oligomer represented by the formula:

$$R^e—R—["PAPE"]—R—R^e$$

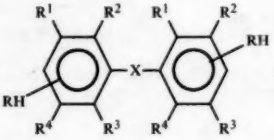
wherein,
R represents O or S in an ether linkage with R^e;
R^e represents a residuum containing a terminal carbon to carbon double bond at each end of the oligomer; and,
"PAPE" represents the residuum of at least one dihydric phenol optionally substituted with inert substituents, so that said crosslinkable oligomer is represented by the formula:

$$R^e—R—["DH(T)P"]_n—R—R^e$$

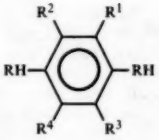
wherein,
n is an integer in the range from 2 to about 100;
["DH(T)P"] is the residuum of dihydric phenol or dihydric thiophenol moieties linked through a linking residue R^s so as to form a repeating unit

$$[DH(T)P—R^s]$$

wherein
DH(T)P is a residuum of a structure selected from



and



X represents a bond between aromatic carbon atoms or a divalent connecting radical selected from the group consisting of C=O, —O—, —S—, —S—S—, $—SO_2—$, —Si— and divalent organic hydrocarbon radicals such as alkylene, alkylidene, cycloaliphatic, or the halogen, alkyl, aryl, or like substituted alkylene, alkylidene and cycloaliphatic radicals as well as alkarylene, cycloalkyl and aromatic radicals, and a ring fused to both Ar groups;
R^1, R^2, R^3, and R^4 are inert substituents, which if present on any phenyl ring, may each be the same or different and represent halogen, particularly chlorine or bromine; NO_2; alkyl having from 1 to about 18 carbon atoms, without regard for the spatial configuration such as normal, iso or tertiary; alkoxy having from 1 to about 18 carbon atoms; and, hydrogen; and, R^s represents the residuum of a reactive linking group selected from the group consisting of the same or another [DH(T)P]; a α-dihaloalkane having from 1 to about 18 carbon atoms; phosgene; alkyl and aryl diacid halides including dihaloaryl having six ring carbon atoms; dihalophenyl phosphonate; bis(haloalkoxy)alkane having from 3 to about 20 carbon atoms; and, dihalocy-

cloalkanes having from 3 to 7 ring carbon atoms; so that the molecular weight $\overline{Mn}$ of said crosslinkable oligomer is in the range from about 1000 to about 10,000.

4,701,515

THERMOTROPIC AROMATIC POLYESTER FROM 3,3'-DIPHENYL-4,4'-DIHYDROXY BIPHENYL AND ARYLENE DICARBOXYLIC ACID

Hans-Rudolf Dicke; Ludwig Bottenbruch, both of Krefeld; Karl-fried Wedemeyer, Cologne; Klaus-Christian Paetz, Burscheid, and Aziz El Sayed, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 2, 1986, Ser. No. 858,667

Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517270

Int. Cl.[4] C08G *63/18*

U.S. Cl. 528—176 **15 Claims**

1. Thermotropic polyester comprising the polymeric reaction product of at least one aromatic dicarboxylic acid and at least one diphenol wherein at least 90 mol percent of the diphenol is 3,3'-diphenyl-4,4'-dihydroxy-diphenyl and the dicarboxylic acid is of the formula

HOOC—A—COOH

wherein, A is an aromatic moiety having 6 to 24 carbon atoms.

4,701,516

COPOLYESTER-CARBONATE RESIN CONTAINING RECURRING DIVALENT UNITS FROM TRIMELLITIC ACID DERIVATIVE

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

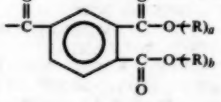
Filed Dec. 30, 1985, Ser. No. 814,398

The portion of the term of this patent subsequent to Oct. 29, 2002, has been disclaimed.

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—176 **16 Claims**

1. A thermoplastic polyester-carbonate resin containing in the polymer chain, divalent moieties of the formula:



(I)

wherein R represents aliphatic hydrocarbyl of from 1 to 9 carbon atoms, inclusive, halogen substituted aliphatic hydrocarbyl of 1 to 9 carbon atoms, inclusive, aralkyl of 7 to 10 carbon atoms, inclusive or halogen substituted aralkyl of 7 to 10 carbon atoms, inclusive; a and b are each whole number integers of from 0 to 1; and the sum of a+b is 1 and wherein there are sufficient linkages of formula I to lower the glass transition temperature of the polymer.

4,701,517

VINYL AROMATIC/TERPENE/PHENOL TERPOLYMER

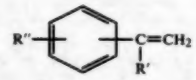
Norman E. Daughenbaugh, Jr., Turtle Creek, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 13, 1986, Ser. No. 839,841

Int. Cl.[4] C08G *83/00*

U.S. Cl. 528—205 **14 Claims**

1. A vinyl-substituted aromatic/terpene/phenol terpolymer having a Ring and Ball softening point of from about 69° C. to about 130° C. prepared from a mixture of monomers comprising, by weight, (1) from about 12% to about 95% of at least one vinyl-substituted aromatic hydrocarbon having the general formula



where R' is hydrogen or $-CH_3$ and R'' is hydrogen, a $-CH=CH_2$ group or a 1–10 C alkyl group, (2) from about 5% to about 75% of at least one monoterpene hydrocarbon and (3) from about 0.75% to about 50% of at least one phenol, based on the monomer charge.

4,701,518

ANTIMICROBIAL NYLON PREPARED IN WATER WITH ZINC COMPOUND AND PHOSPHORUS COMPOUND

Scott E. Osborn, Cantonment; Vincent J. Farrugia, Pensacola, both of Fla.; LeMoyne W. Plischke, Lillian, Ala., and Chester C. Wu, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed May 8, 1986, Ser. No. 860,942

Int. Cl.[4] C08G *69/28, 69/04, 69/16*

U.S. Cl. 528—336 **11 Claims**

1. In a process for preparing nylon wherein nylon-forming monomer(s) in water is (are) heated under controlled conditions of time, temperature and pressure to remove water, effect polymerization of said monomer(s) and provide molten fiber-forming nylon, the improvement of imparting antimicrobial activity to the nylon by adding to the water along with the monomer(s) sufficient amounts of a zinc compound and a phosphorus compound of the formula

where R is hydrogen or an aromatic or aliphatic radical and R' is hydrogen or hydroxyl to form a reaction product in situ containing at least 300 ppm of zinc, based on the theoretical weight of nylon resulting from polymerization of the monomer(s).

4,701,519

METHOD FOR POLYMERIZING CYCLIC POLYCARBONATE OLIGOMERS WITH CATALYST COMPRISING POLYMER CONTAINING ALKALI METAL PHENOXIDE MOIETIES

Thomas L. Evans, Clifton Park, and Carol B. Berman, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1986, Ser. No. 941,901

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—371 **20 Claims**

1. A method for preparing a resinous composition which comprises contacting, at a temperature in the range of about 200°–350° C., at least one cyclic polycarbonate oligomer with a catalyst comprising a polymer containing alkali metal phenoxide moieties.

4,701,520

STEROSPECIFIC CATALYST FOR THE PREPARATION OF POLY (1,2-BUTYLENE OXIDE)

Nicholas M. Irving, Guatemala, Guatemala, assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 17, 1986, Ser. No. 853,101

Int. Cl.[4] C08G *65/12*

U.S. Cl. 528—412 **7 Claims**

1. The method of polymerizing 1,2-butylene oxide simulta-

neously into specific high and low molecular weight ranges of isotactic polymer utilizing a catalyst prepared by a process comprising the steps of:

(a) stirring ferric chloride into a organic solvent;
(b) adding gradually dried 1,2-butylene oxide to the stirred organic solvent;
(c) heating the stirred mixture until the ferric chloride is digested;
(d) adding gradually water in a solvent to the digested mixture;
(e) precipitating the mixture by adding a non-solvent over a period of time; and
(f) recovering a precipitate from the mixture;

the polymerization comprising the steps of:

(a) mixing the catalyst with dried 1,2-butylene oxide in a specified range of proportions;
(b) heating the mixture for a period of time;
(c) dissolving the mixture in a solvent;
(d) stirring in concentrated HCl until a yellow layer forms;
(e) washing the product with water and $NaHCO_3$;
(f) dissolving the washed product into a hydrocarbon solvent;
(g) fractionating the solution to precipitate the high molecular weight range of isotactic polymer 1,2-butylene oxide; and
(h) isolating the low molecular weight range of isotactic polymer 1,2-butylene oxide from the remaining solution.

4,701,521

METHOD OF EFFECTING CELLULAR UPTAKE OF MOLECULES

Hugues J. Ryser, Concord, and Wei-Chiang Shen, Needham, both of Mass., assignors to The Trustees of Boston University, Boston, Mass.

Continuation-in-part of Ser. No. 925,075, Jul. 17, 1978, abandoned, which is a continuation-in-part of Ser. No. 869,894, Jan. 16, 1978, abandoned. This application Jan. 10, 1979, Ser. No. 2,368

Int. Cl.[4] C07K *9/00*

U.S. Cl. 530—322 **1 Claim**

1. A conjugate comprising a nucleotide analogue which is poorly transported into cells covalently bonded to a cationic polymer, said conjugate having enhanced cellular uptake compared to said nucleotide analogue and wherein said nucleotide analogue is 6-mercaptophosphoribosyl purine, cytosine arabinosylphosphate or adenosine arabinosylphosphate.

4,701,522

NOVEL PROTEIN AND PLANT-VIRUS DISEASE PREVENTIVE AGENTS

Kubo Susumu; Ikeda Tsutomu; Takanami Yoichi, and Mikami Yoichi, all of Yokohama, Japan, assignors to Japan Tobacco Inc., Japan

Filed Dec. 31, 1985, Ser. No. 815,444

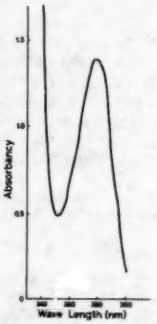
Int. Cl.[4] C07K *15/10*; **A61K** *35/78*

U.S. Cl. 530—370 **12 Claims**

1. A basic protein, which is produced by the process of purifying the extract obtained by extraction of tissue of plants of the genus Mirabilis with a water-soluble solvent, wherein the physicochemical properties comprise:

a. a peak in the ultraviolet absorption spectrum at a wave length of 280 nm,
b. a positive ninhydrin reaction and a negative phenol sulfuric acid reaction,
c. an isoelectric pH of 9 to 10,
d. a molecular weight of 2.42×10^4 as determined by SDS-polyacrylamide gel electrophoresis, and
e. a sedimentation coefficient of 2.5 as determined by ultracentrifugal analysis, and

wherein the amino acid composition comprises:



Amino Acid	Number of Residual Groups
lysine	20
arginine	6
aspartic acid	22
threonine	24
serine	19
glutamic acid	19
proline	8
glycine	12
alanine	18
valine	12
cysteine	1
methionine	3
isoleucine	16
leucine	18
tyrosine	10
phenylalanine	10
tryptophane	1.

4,701,523

WATER-SOLUBLE DISAZO COMPOUNDS CONTAINING ONE OR TWO (NITRO-PHENYLAMINO)-PHENYLAMINO-CHLORO-TRIAZINYLAMINO GROUPS, THE NITRO-PHENYLAMINO BEING ADDITIONALLY SUBSTITUTED BY A FIBER-REACTIVE GROUP OF THE VINYLSULFONE SERIES, SUITABLE AS DYESTUFFS

Marcos Segal, and Michael Kunze, both c/o Hoechst Atkiengesellschaft, P.O. Box 80 03 20, D-6230 Frankfurt am Main 80, Fed. Rep. of Germany

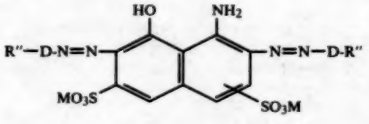
Filed May 13, 1986, Ser. No. 862,681

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517547

Int. Cl.[4] C09B *62/09, 62/513*; **D06P** *1/38, 1/382*

U.S. Cl. 534—634 **2 Claims**

1. A water-soluble disazo compound of the formula

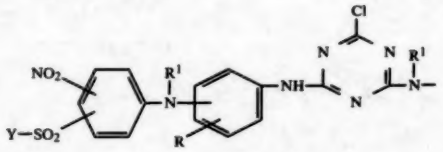


in which

M is hydrogen or an alkali metal or alkaline earth metal;

R" is hydrogen or a group of the formula

in which
Y is vinyl or β-thiosulfatoethyl, β-phosphatoethyl, β-chloroethyl or β-sulfatoethyl,
or
R″ is a group Z, where Z is



in which
R^1 is hydrogen or is alkyl of 1 to 4 carbon atoms unsubstituted or substituted by one or two substituents selected from the group consisting of acetylamino, hydroxy, sulfato, alkoxy of 1 to 4 carbon atoms, sulfo and carboxy,
and the both groups R^1 are identical to or different from each other,
R is hydrogen or sulfo and
Y is vinyl or β-thiosulfatoethyl, β-phosphatoethyl, β-chloroethyl or β-sulfatoethyl;
and the both groups R″ are identical to or different from one another, but at least one of the two R″ mandatorily is a group Z,
the both groups Y in the groups Y—SO_2— and Z are identical to or different from each other;
D is if R″ is hydrogen, a phenyl unsubstituted or substituted by substituents selected from the group of substituents consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carboxy, alkanoylamino or 2 to 5 carbon, benzoylamino, sulfobenzoylamino, phenylamino, sulfophenylamino, carbamoyl, carbamoyl which is monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms, sulfamoyl, sulfamoyl which is monosubstituted or disubstituted by alkyl of 1 to 4 carbon atoms, N-phenylsulfamoyl, N-phenyl-N-(C_1–C_4-alkyl)-sulfamoyl, cyano, nitro, chlorine, bromine, fluorine, trifluoromethyl, hydroxy and sulfo, or
D is if R″ is hydrogen, a naphthyl unsubstituted or substituted by substituents selected from the group of substituents consisting of sulfo, carboxy, methyl, ethyl, methoxy, ethoxy, alkanoylamino of 2 to 5 carbon atoms, sulfobenzoylamino, benzoylamino, chlorine, hydroxy and nitro, or
D is if R″ a group Y—SO_2—, a phenylene unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carboxy, chlorine, bromine, fluorine, trifluoromethyl and sulfo, or is a naphthylene unsubstituted or substituted by 1 or 2 sulfo, or
D is if R″ is a group Z, a phenylene unsubstituted or substituted by 1 to 2 substituents selected from the group of substituents consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chlorine and sulfo.

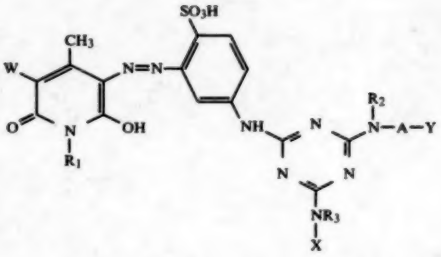
4,701,524

PYRIDONE MONOAZO COMPOUND HAVING VINYLSULFONE TYPE FIBER-REACTIVE GROUP

Yutaka Kayane, Ibaraki; Hirokazu Sawamoto, Minoo; Takashi Omura, Ashiya; Naoki Harada, Suita, and Akira Takeshita, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 5, 1985, Ser. No. 795,123
Claims priority, application Japan, Nov. 20, 1984, 59-245671
Int. Cl.[4] C09B *62/45, 62/53;* **D06P** *1/384, 3/66*
U.S. Cl. 534—642 **5 Claims**

1. A monoazo compound, or a salt thereof, represented by the formula,



wherein W is hydrogen or carbamoyl, R_1 is lower alkyl, R_2 and R_3 are independently hydrogen or lower alkyl, A is phenylene unsubstituted or substituted with one or two members selected from the group consisting of chlorine, bromine, methyl, ethyl, methoxy, ethoxy and sulfo, or naphthylene unsubstituted or substituted with one sulfo, Y is —$SO_2CH_2CH_2Z$, in which Z is a group capable of being split by the actio of an alkali, and X is sulfo- or carboxy-substituted phenyl or naphthyl unsubstituted or substituted with methyl, methoxy, or halogen, or sulfo-or carboxy-substituted lower alkyl.

4,701,525

POLYAZO DYESTUFFS HAVING HIGH UV ABSORPTION

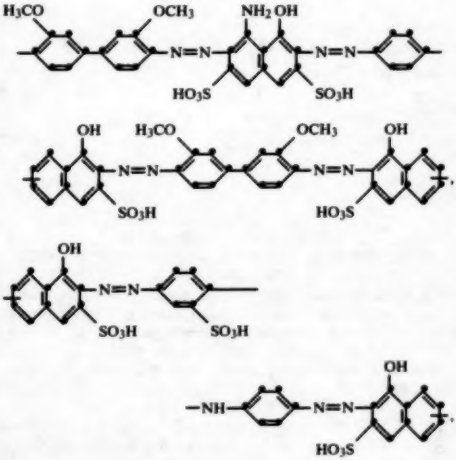
Thomas-Markus Rohr, and Jakob Kuhn, both of Marly, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 757,549, Jul. 19, 1985, Pat. No. 4,609,609.
This application Jun. 2, 1986, Ser. No. 869,508
Claims priority, application Switzerland, Jul. 24, 1984, 3577/84
Int. Cl.[4] C09B *31/30;* **C08J** *3/24;* **C08K** *5/23;* **G03C** *1/02*
U.S. Cl. 534—678 **1 Claim**

1. A compound of the formula

$$(B—L—_mA—L'—B')_n,$$

in which A is a radical of the formula



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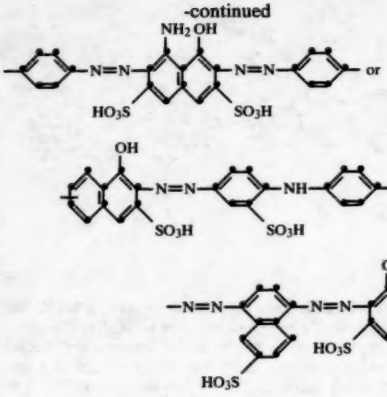
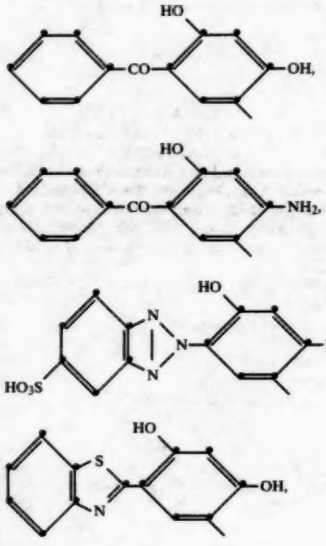


L and L' are —N=N—, B and B' are identical or different from each other and denote a radical of the formula



and m is 1 or 2 and n is 0, 1 or 2.

4,701,526

PROCESS FOR PREPARING 9-(2-HYDROXYETHOXYMETHYL)-GUANINE, AND INTERMEDIATES USEFUL IN SAID PROCESS

Joze Kobe, Ljubljana; Joze Gnidovec, and Pavle Zupet, both of Novo mesto, all of Yugoslavia, assignors to KRKA, tovarna zdravil, n.sol.o., Novo mesto, Yugoslavia

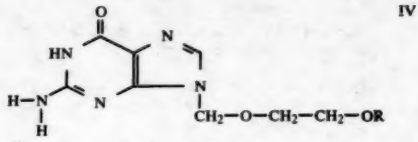
Filed Dec. 11, 1985, Ser. No. 807,724

Claims priority, application Yugoslavia, Dec. 22, 1984, 2190/84

Int. Cl.[4] C07D *473/18*

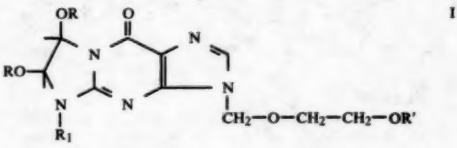
U.S. Cl. 544—251 **14 Claims**

1. Process for preparing 9-(2-hydroxyethoxymethyl)-guanine of the formula



IV

characterized in that a compound of the formula I



I

wherein R and R' may be the same or different and represent hydrogen, (C_1–C_8)acyl or benzyl and R_1 represents (C_1–C_8)acyl is hydrolyzed under mild basic conditions.

4,701,527

SYNTHESIS OF SALICYLAMIDES WITH IMPROVED REACTION KINETICS AND IMPROVED EFFECTIVE YIELDS

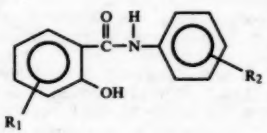
Gerald S. Koermer, Springfield; Eddie N. Gutierrez, Fort Lee, and Maryfrances Prorok, Tenafly, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 558,066, Dec. 5, 1983, abandoned. This application Nov. 20, 1984, Ser. No. 673,308

Int. Cl.[4] C07C *103/22*

U.S. Cl. 544—277 **21 Claims**

1. A method of synthesizing salicylamide compounds of the formula:



wherein R_1 is $—COC_nH_{2n+1}$ wherein n is an integer with a value of from 1 through to about 15 and R_2 is a substituent selected from the group consisting of —H, —CN, $—NO_2$, —F, —Cl, —Br, —I, $—CF_3$, $—CBr_3$, $—CCl_3$, $—CI_3$ and R_1 which comprises heating a phenyl salicylate ester bearing an R_1 substituent on the benzene ring of the salicylic acid portion thereof with an R_2 substituted aniline in a mole ratio of said ester to said substituted aniline of about one to one to one to two and with about 0.01 to about 0.25 mole part of a Lowry-Bronsted acid catalyst selected from the group consisting of aliphatic carboxylic acids, aromatic carboxylic acids, hydrogen halides, hydrogen halide salts of R_2 substituted anilines and mixtures thereof at a temperature of above about 150° C.

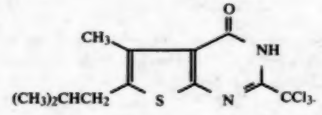
4,701,528

INTERMEDIATES USEFUL IN THE PREPARATION OF 3,4-DIHYDRO-4-OXOTHIENO[2,3-D]PYRIMIDINE-2-CARBOXYLATES AND PROCESS FOR PREPARING SAME

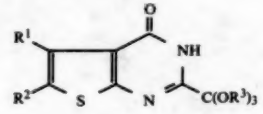
Michael D. Thompson, and Gary D. Madding, both of Evansville, Ind., assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,166
Int. Cl.[4] C07D *495/04*
U.S. Cl. 544—278 5 Claims

1. A compound having the formula



2. A compound having the formula:



wherein R^1 and R^2 are selected from the group consisting of hydrogen, lower alkyl having from 1 to 8 carbon atoms, lower alkenyl having from 3 to 6 carbon atoms, lower alkoxy having from 1 to 6 carbon atoms, hydroxy, nitro, amino, halo, phenyl, alkanoyl having from 2 to 6 carbon atoms or they are bonded to one another to form a cycloalkene ring fused to the thiophene ring and having a total of from 5 to 7 annular ring carbon atoms, and R^3 is lower alkyl.

4,701,529

SINGLE PASS PROCESS FOR MAKING TRIMETHYL PYRIDINE

Loren L. Swearingen, Irving; Wallace E. Embrey, Freeport; Randy J. LaTulip; Jim D. Earls, both of Lake Jackson, all of Tex., and Garnet E. McConchie, Stade, Fed. Rep. of Germany, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 793,890, Nov. 1, 1985, abandoned. This application Oct. 9, 1986, Ser. No. 916,772
Int. Cl.[4] C07D *213/9*
U.S. Cl. 546—251 7 Claims

1. A method for the preparation of 2,4,6 trimethylpyridine (TMP) which comprises

(A) reacting a member of the group consisting of acetone, mesityl oxide, and diacetone alcohol with ammonia in the presence of an inorganic dehydrogenation catalyst containing one of more metals from Groups IVB to VIII of the Periodic Table or their compounds selected from the group consisting of oxides, halides, sulfides, selenides, molybdates, chromates, and manganates at a temperature in the range from about 300° to about 475° C. under a pressure in the range from about 2 to about 50 atmospheres with a liquid hourly space velocity from 0.01 to 50 reciprocal hours and a mole ratio of ammonia to said above group member equal to or greater than 0.2:1 to form a mixture of products containing a high proportion of TMP and

(B) recovering TMP from said mixture.

5. A method for the preparation of 2,4,6-trimethylpyridine (TMP) which comprises

(A) reacting a member of the group consisting of acetone, mesityl oxide, and diacetone alcohol with ammonia in the presence of an inorganic catalyst containing one or more metals selected from the group consisting of platinum, palladium, nickel, cobalt, rhodium, tungsten, molybdenum and rhenium or their oxides at a temperature in the range from about 360° to about 390° C. under a pressure in the range from 2 to 50 atmospheres with a liquid hourly space velocity in the range from 0.2 to 2.0 reciprocal hours and a mol ratio of ammonia to said above group member in the range from 4:1 to 8:1 to form a mixture of products containing a high proportion of TMP and

(B) recovering TMP from said mixture.

4,701,530

TWO-STAGE PROCESS FOR MAKING TRIMETHYL PYRIDINE

Loren L. Swearingen, Irving, and Randy J. LaTulip, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 797,278, Nov. 12, 1985, abandoned. This application Oct. 1, 1986, Ser. No. 914,203
Int. Cl.[4] C07D *213/09*
U.S. Cl. 546—251 6 Claims

1. A method for the preparation of 2,4,6-trimethyl pyridine (TMP) in high yields which comprises

(A) reacting a carbonyl compound with ammonia in the presence of a condensation catalyst at a temperature in the range from about 100° to about 200° C. and using a suitable mole ratio of reactants, pressure range, and space velocity range to form a mixture containing a high 2,2,4,6-tetramethyl-1,2-dihydropyridine content;

(B) recovering said dihydropyridine in a substantially purified form;

(C) contacting said purified dihydropyridine with a cracking catalyst in the presence of a molar excess of a gaseous diluent at a temperature in the range from about 250° to about 450° C., and with a suitable space velocity and pressure range to prepare a mixture containing a high TMP content; and

(D) recovering TMP from said mixture.

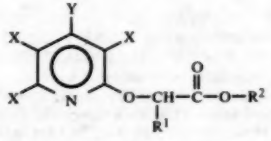
4,701,531

CATALYZED ALKYLATION OF HALOPYRIDINATES IN THE ABSENCE OF ADDED ORGANIC SOLVENTS

Timothy J. Adaway, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 1, 1986, Ser. No. 936,548
Int. Cl.[4] C07D *213/30, 213/36, 213/64*
U.S. Cl. 546—297 11 Claims

1. A process for preparing an O-alkylated halopyridinate compound of the formula



(I)

wherein

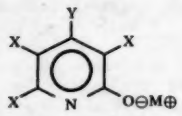
each X independently represents hydrogen or halogen;

Y is hydrogen, halogen or $-NR^3R^4$ wherein R^3 and R^4 are each independently hydrogen or lower alkyl;

R^1 is hydrogen or methyl; and

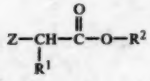
R^2 is lower alkyl;

comprising contacting an aqueous slurry containing a halopyridinate of the formula



(II)

wherein M⊕ represents an alkali, alkaline earth metal or ammonium, with about equimolar amounts of a haloester of the formula



(III)

wherein

R^1 and R^2 are as defined hereinabove; and

Z is a leaving group selected from the group consisting of chloro, bromo, iodo, tosylate, mesylate and brosylate, in the presence of a catalytic amount of a phase transfer catalyst and in the absence of an added organic solvent; and recovering said O-alkylated halopyridinate compound.

4,701,532

METHOD OF SELECTIVELY CHLORINATING 2-CHLORO-5-(TRICHLOROMETHYL) PYRIDINE IN THE 3-POSITION

Paula L. Humphreys, San Ramon; Thomas J. Dietsche, Berkeley, and James L. Bixby, Pleasant Hill, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 718,610, Apr. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 655,200, Sep. 28, 1984, abandoned, which is a continuation-in-part of Ser. No. 479,056, Mar. 25, 1983, abandoned. This application Mar. 27, 1986, Ser. No. 844,647

Int. Cl.[4] C07D *213/61*

U.S. Cl. 546—345 **11 Claims**

1. A method of selectively chlorinating 2-chloro-5-(trichloromethyl)pyridine in the 3-position which comprises contacting 2-chloro-5-(trichloromethyl)pyridine in the liquid phase in the absence of a solvent with an effective amount of Cl_2 at a pressure of from about 50 to 1000 psig and a temperature of from about 125° C. to about 180° C. in the absence of a catalyst or in the absence of a catalyst other than $FeCl_3$ whereby the product contains 2,3-dichloro-5-(trichloromethyl)pyridine and 2,6-dichloro-3-(trichloromethyl)pyridine as the major components and the 2,3-dichloro-5-(trichloromethyl)pyridine is produced in a ratio to 2,6-dichloro-3-(trichloromethyl)pyridine of at least 2.8 to 1.

4,701,533

PROCESS FOR PREPARING SUBSTITUTED 2,3,4,9-TETRAHYDRO-1H-CARBAZOLE-1-ACETIC ACID

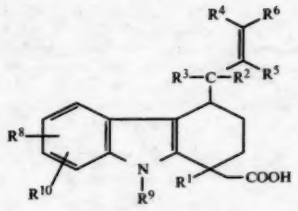
Dominick Mobilio; Christopher A. Demerson, both of Plainsboro, and Leslie G. Humber, North Brunswick, all of N.J., assignors to American Home Products Corporation, Del.

Continuation-in-part of Ser. No. 900,488, Aug. 26, 1986, which is a continuation-in-part of Ser. No. 830,598, Feb. 18, 1986, which is a division of Ser. No. 797,561, Nov. 13, 1985, Pat. No. 4,616,028, which is a continuation-in-part of Ser. No. 726,197, Apr. 22, 1985, abandoned. This application Feb. 18, 1987, Ser. No. 16,042

Int. Cl.[4] C07D *209/86*

U.S. Cl. 548—439 **2 Claims**

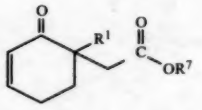
1. Process for the production of the compound of structure (I)



(I)

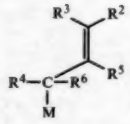
wherein R^1 is lower alkyl, R^2, R^3, R^4, R^5 and R^6 are hydrogen or lower alkyl, R^8 and R^{10} are independently hydrogen, lower alkyl or halogen, R^9 is hydrogen or lower alkyl, which comprises

(a) reacting the compound of structure (IV)

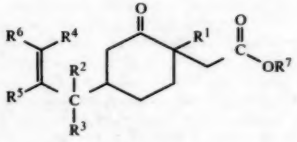


(IV)

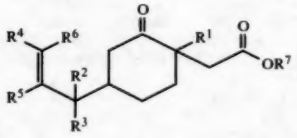
wherein R^1 is as defined above and R^7 is lower alkyl with



wherein R^2, R^3, R^4, R^5 and R^6 are as defined above and M may be $SiR^{11}R^{12}R^{13}$ or $SnR^{11}R^{12}R^{13}$ wherein R^{11}, R^{12} and R^{13} are independently selected from the group consisting of hydrogen, straight chain or branched lower alkyl containing 1 to 6 carbon atoms, cycloalkyl, aryl, arylalkyl, halogen or alkoxy, with the reaction being carried out in the presence of an acid to obtain a compound or compounds of structures Va or Vb,



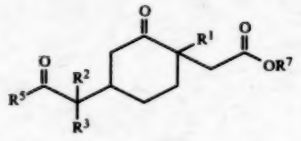
(Va)



(Vb)

(b) reacting a compound of structure Va or Vb with a suitable oxidizing agent to form a compound of structure (XIII)

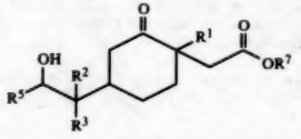
(XIII)



wherein R^1, R^2, R^3, R^5 and R^7 are as defined above

(c) reducing the compound of structure (XIII) with a suitable reducing agent to form a compound of structure (XIV)

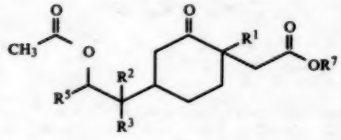
(XIV)



wherein R^1, R^2, R^3, R^5 and R^7 are as defined above

(d) acetylating the compound of structure (XIV) to form a compound of structure (XV)

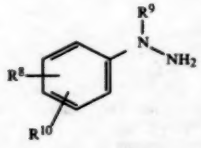
(XV)



wherein R^1, R^2, R^3, R^5 and R^7 are as defined above

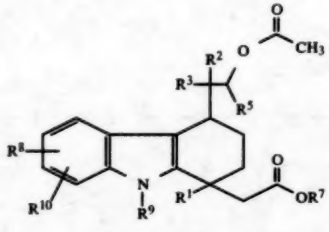
(e) reacting the compound of structure (XV) with a compound of structure (VI)

(VI)



wherein R^8 and R^{10} are independently hydrogen, lower alkyl or halogen and R^9 is hydrogen or lower alkyl to form a compound of structure (XVI)

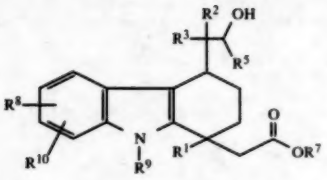
(XVI)



wherein R^1, R^2, R^3, R^5, R^7, R^8, R^9 and R^{10} are as defined above

(f) alcoholysis of the compound of structure (XVI) to remove the acetate group and forming the compound of structure (XVII)

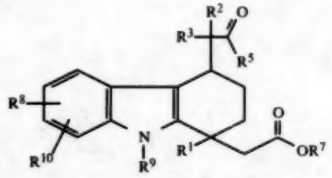
(XVII)



wherein R^1, R^2, R^3, R^5, R^7, R^8, R^9 and R^{10} are as defined above

(g) oxidizing the alcohol of structure (XVII) to obtain the compound of structure (XVIII)

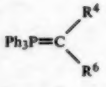
(XVIII)



wherein R^1, R^2, R^3, R^5, R^7, R^8, R^9 and R^{10} are as defined above

(h) reacting the compound of structure (XVIII) with the compound of structure (XIX)

(XIX)



wherein R^4 and R^6 are independently hydrogen or lower alkyl affording the ester of compound (I), and further hydrolyzing said ester to obtain the compound (I).

4,701,534

AZETIDINE DERIVATIVE

Ronald F. Mason, Ashford, England; Gary Scholes, The Hague, and Jan W. van Reijendam, Amsterdam, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 743,735, Jun. 12, 1985, Pat. No. 4,665,197. This application May 5, 1986, Ser. No. 859,663

Claims priority, application United Kingdom, Jun. 19, 1984, 8415615; May 7, 1985, 8511527

Int. Cl.[4] C07D *205/04*

U.S. Cl. 548—950 **1 Claim**

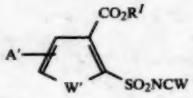
1. 2-Benzyl-7,7-dimethyl-6,8-dioxa-2-aza-spiro[3,5]nonane, of the formula

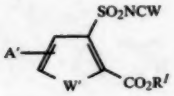
4,701,535
AGRICULTURAL UREAS AND ISOUREAS

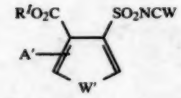
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 662,444, Oct. 15, 1984, Pat. No. 4,599,103, which is a continuation-in-part of Ser. No. 196,267, Oct. 22, 1980, abandoned. This application Apr. 7, 1986, Ser. No. 849,263
Int. Cl.[4] C07D *409/00, 333/36, 407/00, 307/02*
U.S. Cl. 549—60 1 Claim

1. A compound selected from


I


II


III

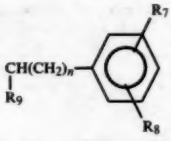
wherein

W is oxygen or sulfur;

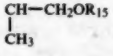
W' is oxygen or sulfur;

A' is H, Cl, Br, C_1–C_4 alkyl, OCH_3, NO_2 or CF_3;

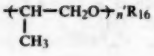
R^1 is C_1–C_6 alkyl; C_3–C_6 alkenyl; C_3–C_6 alkynyl; C_2–C_6 alkyl substituted with Cl, CN or OCH_3; C_3–C_6 alkenyl substituted with 1–3 Cl; C_3–C_6 alkynyl substituted with Cl; C_3–C_6 cycloalkyl; cyclohexenyl; cyclohexyl substituted with 1–3 CH_3; C_4–C_7 cycloalkylalkyl or



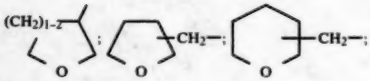
where R_7 and R_8 are independently H, Cl, CH_3 or OCH_3; n is 0 or 1; and R_9 is H or CH_3; $CH_2CH_2OR_{15}$, $CH_2CH_2CH_2OR_{15}$,



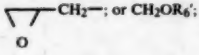
where R_{15} is C_2H_5, $CH(CH_3)_2$, phenyl, CH_2CH_2Cl, CH_2CCl_3; $—CH_2CH_2O—_{n'}R_{16}$,



where R_{16} is CH_3, C_2H_5, $CH(CH_3)_2$, phenyl, CH_2CH_2Cl, CH_2CCl_3, and n' is 2 or 3; CH_2CN;



-continued



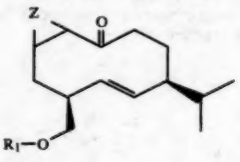
where R_6' is C_1–C_4 alkyl; provided R^1 has a total of ≦13 carbon atoms.

4,701,536
NOVEL 10-MEMBERED RING COMPOUND AND PROCESS FOR PREPARING THE SAME

Jiro Tsuji, Kamakura, and Takashi Takahashi, Tokyo, both of Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Jul. 7, 1986, Ser. No. 882,592
Claims priority, application Japan, Jul. 10, 1985, 60-150091
Int. Cl.[4] C07D *303/02;* C07F *7/02, 7/08, 7/18*
U.S. Cl. 549—215 8 Claims

1. A compound of Formula I:


I

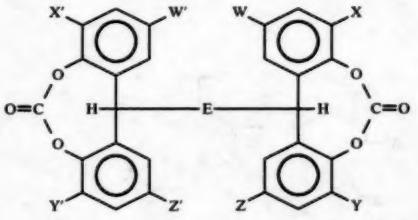
wherein R_1 represents a hydrogen atom or a protective group for a hydroxyl group; and Z represents a direct bond (2,3-cis-5R*,8S*) or an oxygen atom which forms an oxirane ring having a configuration of (2R*, 3R*, 5R*, 8S*).

4,701,537
AROMATIC BIS CYCLIC CARBONATES

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 688,244, Jan. 2, 1985, Pat. No. 4,604,434. This application Mar. 24, 1986, Ser. No. 843,014
Int. Cl.[4] C07D *321/12*
U.S. Cl. 549—228 7 Claims

1. A bis cyclic carbonate of the formula



wherein X, Y, X' and Y' are the same or different and are hydrogen or alkyl of one to about six carbon atoms, inclusive; W, W', Z and Z' are the same or different and are alkyl of one to about six carbon atoms, inclusive, and E is alkylene of two to about twelve carbon atoms, inclusive.

4,701,538

COMPOSITION COMPRISING BICYCLIC CARBONATE OLIGOMER

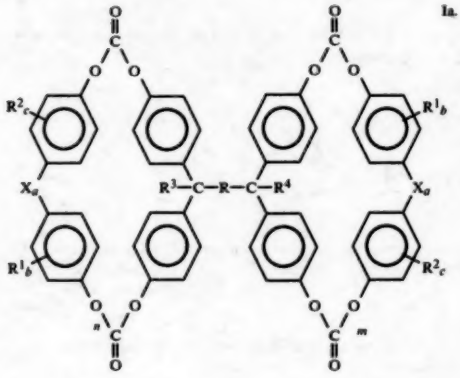
Niles R. Rosenquist, Evansville, and Kenneth F. Miller, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Nov. 12, 1985, Ser. No. 796,985

Int. Cl.[4] C07D *321/00, 319/06;* **C08G** *63/62*

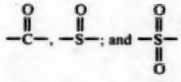
U.S. Cl. 549—228 **8 Claims**

1. A composition comprising a cyclic oligomer of the formula



Ia.

wherein X is selected from th group consisting of alkylene of two to twelve carbon atoms, inclusive, alkylidene of one to twelve carbon atoms, inclusive, cycloalkylidene of four to twelve carbon atoms, inclusive,—S—, —O—, —S—S—,



a is zero or 1;

n and m are the same or different and are integers of one to about fifteen;

R is alkylene of two to eight carbon atoms, inclusive or alkylidene of one to eight carbon atoms, inclusive, phenylene or R represents a single bond;

R^1 and R^2 are the same or different and are alkyl or one to four carbon atoms, inclusive or halo;

b and c are the same or different and are integers of zero to four; and

R_3 and R_4 are the same or different and are alkyl of one to eight carbon atoms, inclusive, phenyl, hydrogen or R_3 and R_4 are taken together to form an alkylene of two to eight carbon atoms inclusive.

4,701,539

3,4-DIHYDRO-4,4-DIMETHYL-2H-PYRAN-2-ONE, AN INSECTICIDE INTERMEDIATE

Kiyoshi Kondo; Toshiyuki Takashima, and Minoru Suda, all of Kanagawa, Japan, assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 662,547, Oct. 19, 1984, abandoned, which is a continuation of Ser. No. 341,372, Jan. 21, 1982, abandoned, which is a division of Ser. No. 162,292, Jun. 23, 1980, Pat. No. 4,342,694, which is a division of Ser. No. 90,223, Nov. 1, 1979, Pat. No. 4,235,780. This application Jul. 24, 1986, Ser. No. 890,805

Int. Cl.[4] C07D *309/32*

U.S. Cl. 549—294 **1 Claim**

1. The compound of 3,4-dihydro-4,4-dimethyl-2H-pyran-2-one.

4,701,540

PROCESS FOR CAROTENOID INTERMEDIATES

Teodor Lukàc, Aesch; Milan Soukup, Stein, and Erich Widmer, Münchenstein, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

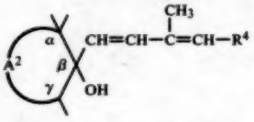
Filed Mar. 12, 1984, Ser. No. 588,268

Claims priority, application Switzerland, Mar. 25, 1983, 1646/83

Int. Cl.[4] C07D *317/20, 317/72;* **C07C** *37/00, 43/184*

U.S. Cl. 549—341 **13 Claims**

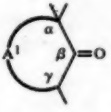
1. A process for producing a 3-methyl-2,4-pentadien-1-ol derivative of the formula:



V

wherein R^4 is $—CHR^2R^3$, $—CH_2OH$ or —CHO, R_2 is hydrogen or an ether group, R_3 is an ether group or the two ether groups of R^2 and R^3 together represent a cyclic diether group, A^2 is a chain of 2 or 3 carbon atoms which can be optionally substituted by 1 or 2 hydroxy or ether groups or a geminal or vicinal cyclic diether group or an oxo group and the ends of the carbon chain A^2 are linked with the carbon atoms in the α- and γ-positions,

from a cyclic ketone of the formula:

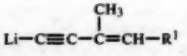


I

wherein A^1 is a chain of 2 or 3 carbon atoms which can be optionally substituted by 1 or 2 ether groups or a geminal or vicinal cyclic diether group, the ends of the chain being linked with the carbon atoms in the α- and γ-positions,

comprising

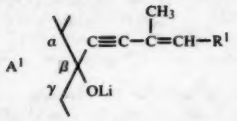
(a) reacting said cyclic ketone with a lithium salt of the formula:



II

wherein R_1 is CHR^2R^3 or CH_2OLi and R_2 and R_3 are as above

in an inert organic solvent to produce a alkoxide of the formula:



III

wherein A^1 and R^1 are as above;
(b) reducing said alkoxide with an aluminum hydride of the formula:

$$(C_nH_{2n+1}—O—C_mH_{2m}O)_xMeAlH_{4-x} \qquad IV$$

wherein Me is an alkali metal, x is a number of from 1 to 3 and m and n each are a number of from 1 to 7
to produce an aluminium complex of said 3-methyl-2,4-pentadien-1-ol derivative; and (c) hydrolyzing said aluminium complex to produce said 3-methyl-2,4-pentadien-1-ol derivative.

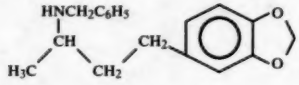
4,701,541

MEDROXALOL INTERMEDIATES

Richard E. Donaldson, and John F. Hoops, both of Midland, Mich., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Nov. 24, 1986, Ser. No. 933,825
Int. Cl.[4] C07D *317/54*
U.S. Cl. 549—440 **2 Claims**

1. A compound, 1-(3,4-methylenedioxyphenyl)-3-(N-benzylamino)butane, having the structural formula:



or an acid addition salt thereof.

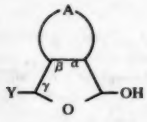
4,701,542

RESOLUTION OF HEMIACETALS AND ALCOHOLS

Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous Bois, both of France, assignors to Roussel Uclaf, Paris, France

Continuation of Ser. No. 446,705, Dec. 3, 1982, abandoned. This application Mar. 31, 1986, Ser. No. 846,570
Claims priority, application France, Dec. 9, 1981, 81 23003
Int. Cl.[4] C07D *300/77*
U.S. Cl. 549—456 **8 Claims**

1. A process for the resolution of hemiacetal compounds of the formula

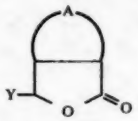


III

wherein A is a hydrocarbon chain containing 1 to 16 carbon atoms linked together and optionally containing at least one heteroatom and one or more unsaturations, the assembly of the group constituting the chain may be a mono- or polycyclic system including a spiro or endosystem and the assembly of chain A and the carbon attoms attached thereto can contain at least one chiral atom or the hemiacetal coupled thereto can present a chirality due to the dissymetric spatial configuration of the molecule and Y is selected from the group consisting of hydrogen, alkyl of 1 to 18 carbon atoms optionally substituted, $—CY_3'$ and the β, γ bond together with Y can be part of A and Y' is bromine or chlorine and the resolution of alcohols of the formula

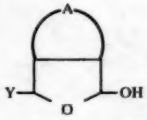
$$R—OH \qquad IV$$

wherein R is selected from the group consisting of primary, secondary or tertiary alcohol moiety having at least one asymetric carbon or the remainder of a substituted alcohol with a chirality due to the dissymetric spatial configuration of the entire molecule comprising reacting in an organic solvent diisobutyl aluminum hydride and a racemate or optical isomer of a compound of the formula



II

wherein A and Y have the above definition to obtain a compound of the formula

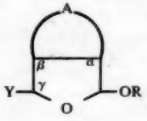


III

and reacting the latter with a racemate or optical isomer of a compound of the formula

$$R—OH \qquad IV$$

wherein R has the above definition to obtain a compound of the formula



I

wherein Y, A and R have the above definitions, separating the diastereoisomers and cleaving the latter to obtain the enantiomers of the hemiacetal of formula III if the racemate was used above or the alcohol of formula IV if the racemate was used above.

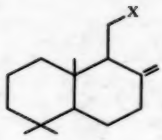
4,701,543

PROCESS FOR THE PREPARATION OF OXYGENATED DECALINE DERIVATIVES

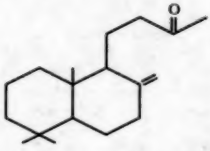
Ferdinand Naef, Carouge, and Christian Vial, Le Lignon, both of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed Jul. 18, 1986, Ser. No. 886,845
Claims priority, application Switzerland, Aug. 12, 1985, 3445/85
Int. Cl.[4] C07D *307/92*
U.S. Cl. 549—458 **4 Claims**

1. Process for the preparation of oxygenated decaline derivatives of formula

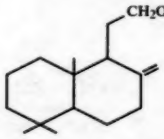

(I)

wherein symbol X represents a COOH or a CHO radical, which comprises oxidizing a ketone of formula


(II)

by means of oxygen in a basic medium constituted by potassium tert-butoxide in solution in 1,2-dimethoxyethane.

4. Process for the conversion of the product obtained according to claim 1 into 3a,6,6,9a-tetramethylperhydronaphtho[2,1-b]furan by reducing it with a metal hydride to give a carbinol of formula



and cyclizing the said carbinol by means of an acidic cyclization agent.

4,701,544

METHOD FOR MAKING REACTION PRODUCTS OF PHOSGENE AND DIHYDRIC PHENOL

James M. Silva, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 4, 1986, Ser. No. 892,549

Int. Cl.[4] C07C *68/00*

U.S. Cl. 558—281 **6 Claims**

1. A method for making phosgene-dihydric phenol reaction products in a condenser/absorber-vented reactor under interfacial reaction conditions whereby reduced phosgene blow-by is achieved, comprising,

(1) effecting reaction between a dihydric phenol and phosgene under interfacial reaction conditions in the presence of aqueous base, water, and methylene chloride at a temperature in the range of between 10°–40° C.,

(2) venting phosgene-containing volatiles from (1) through the condenser connected to a methylene chloride fed absorber, and

(3) returning phosgene-containing methylene chloride from the absorber to the reactor,

where there is used a volume ratio of water to methylene chloride having a value of from 0.25 to 1.5, which is sufficient to provide a product concentration of from 1 to 12%, based on the total weight of solvent.

4,701,545

PREPARATION OF α,α-DIHALOALKYL BORONIC ESTERS

Donald S. Matteson and Gerald D. Hurst, both of Pullman, Wash., assignor to Washington State University Research Foundation, Inc., Pullman, Wash.

Filed Feb. 12, 1986, Ser. No. 828,611

Int. Cl.[4] C07C *107/02*; C07F *5/04*

U.S. Cl. 558—298 **26 Claims**

1. A process for preparing dihaloalkyl boronic esters, which comprises the step of reacting a sterically hindered strong base with a mixture of dihaloalkane and trialkyl borate in an organic solvent at a reaction temperature between about −78° C. and about +25° C.

4,701,546

PREPARATION OF 2-(N-FORMYLAMINO)-PROPIONITRILE

Wolfgang Bewert, Frankenthal, and Hans Kiefer, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 23, 1986, Ser. No. 866,775

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1985, 3520982

Int. Cl.[4] C07C *121/43*

U.S. Cl. 558—445 **15 Claims**

1. A process for the production of 2-(N-formylamino)-propionitrile which comprises:

reacting 1 mole of acrylonitrile with 2 to 20 moles of formamide at a temperature of from 80° C. to 130° C. and in the presence of a catalyst, said catalyst consisting essentially of a tertiary nitrogen amine base having a p_K value of less than 5.

4,701,547

HIGH TEMPERATURE LIQUID-CRYSTALLINE ESTER COMPOUNDS

Shigeru Sugimori, and Tetsuhiko Kojima, both of Kanagawaken, Japan, assignors to Chisso Corporation, Osaka, Japan

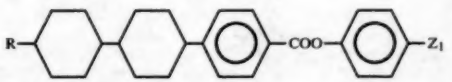
Division of Ser. No. 477,973, Mar. 23, 1983, Pat. No. 4,502,974. This application Dec. 19, 1984, Ser. No. 683,631

Claims priority, application Japan, Mar. 31, 1982, 57-53366; May 20, 1982, 57-85269; May 20, 1982, 57-85271; May 31, 1982, 57-92772; Jun. 17, 1982, 57-104365; Jun. 23, 1982, 57-107724; Jul. 6, 1982, 57-117409; Jul. 21, 1982, 57-127291; Jul. 21, 1982, 57-127295; Aug. 2, 1982, 57-134964; Aug. 5, 1982, 57-136658; Aug. 11, 1982, 57-139451; Aug. 11, 1982, 57-139452; Aug. 24, 1982, 57-146594; Aug. 24, 1982, 57-146595; Aug. 30, 1982, 57-150424; Sep. 3, 1982, 57-153601; Oct. 5, 1982, 57-175145; Oct. 26, 1982, 57-188047; Nov. 4, 1982, 57-193637; Jan. 12, 1983, 58-3254; Jan. 27, 1983, 58-11906

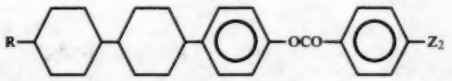
Int. Cl.[4] C07C *69/76*; C09K *19/30*

U.S. Cl. 560—102 **1 Claim**

1. Liquid crystalline ester compounds expressed by the formula



or



wherein R represents a hydrogen atom or an alkyl group of 1 to 10 carbon atoms, and Z_1 and Z_2 each represent Cl.

4,701,548

THIOALKANOIC ACID ESTERS OF PHENYLALKANOLS

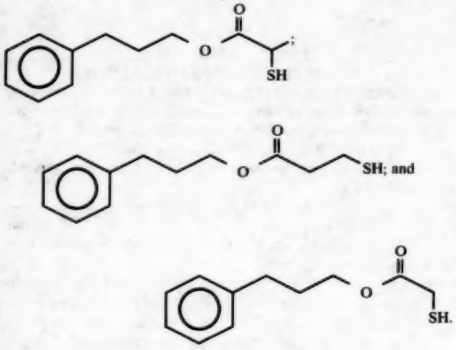
Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Manfred H. Vock, Locust; Domenick Luccarelli, Jr., Neptune; Kevin P. Miller, and Charles Wiener, both of Middletown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 778,506, Sep. 20, 1985, Pat. No. 4,634,595. This application Aug. 8, 1986, Ser. No. 894,868

Int. Cl.[4] C07C *149/20*

U.S. Cl. 560—152 **4 Claims**

1. A thioalkanoic acid ester of a phenylalkanol having a structure selected from the group consisting of:



4,701,549

ALKENYLAMINO CARBONYL CARBAMATES

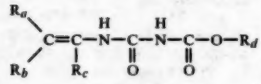
Michael J. Mullins, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 817,709, Jan. 10, 1986, abandoned, which is a division of Ser. No. 682,528, Dec. 17, 1984, Pat. No. 4,572,804. This application Jun. 25, 1986, Ser. No. 878,142

Int. Cl.[4] C07C *127/22*

U.S. Cl. 560—159 **20 Claims**

1. A compound represented by the formula:



wherein R_a, R_b and R_c are independently H or alkyl, and R_d is alkyl.

4,701,550

PROCESS FOR PREPARING ALKYL ESTERS OF METHYLTARTRONIC ACID

Carlo Venturello; Enzo Alneri; Alfredo Coassolo, and Rino D'Aloisio, all of Novara, Italy, assignors to Istituto Guido Donegani S.p.A., Novara, Italy

Filed Jun. 17, 1985, Ser. No. 745,238

Claims priority, application Italy, Jun. 18, 1984, 21460 A/84

Int. Cl.[4] C07C *67/40*

U.S. Cl. 560—180 **5 Claims**

1. A method of preparing alkyl esters of methyltartronic acid, characterized in that:

(a) methacrylic acid is reacted, at 50°–100° C., with hydrogen peroxide in an aqueous medium, in the presence of a catalyst selected from the group consisting of tungstic acid and alkali metal salts thereof at pH values lower than 2;

(b) the thus obtained alpha-methyl-glyceric acid is oxidized, at 60°–100° C., in an aqueous solution of an inorganic base, by means of an oxidizing agent selected from the group consisting of concentrated nitric acid (at least 40% by weight), oxygen, and air, in the presence of a catalyst selected from the group consisting of palladium, platinum, and oxides thereof, carried on carbon; and

(c) the thus obtained methyl-tartronic acid is esterified with an alkyl alcohol having from 1 to 4 C atoms.

4,701,551

PROCESS FOR PREPARING TRIFLUOROACETIC OR TRICHLOROACETIC ACID ESTERS

Michel DesBois, Rillieux La Pape, and Louis Amiet, Lyons, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jul. 21, 1986, Ser. No. 887,570

Claims priority, application France, Jul. 26, 1985, 85 11436

Int. Cl.[4] C07C *69/63*

U.S. Cl. 560—226 **9 Claims**

1. A process for preparing a trifluoroacetic or trichloroacetic acid ester, comprising the steps of reacting trifluoroacetic or trichloroacetic acid with a non-perfluorinated alcohol in liquid hydrofluoric acid and separating the ester obtained by decantation.

4,701,552

L-AMINODICARBOXYLIC ACID ALKANES

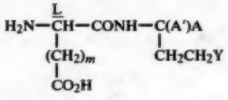
Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 730,975, May 6, 1985, Pat. No. 4,603,012. This application Mar. 21, 1986, Ser. No. 842,348

Int. Cl.[4] C07C *103/37*; A23L *1/236*

U.S. Cl. 562—498 **69 Claims**

1. A compound represented by the formula:



wherein

A is hydrogen, alkyl containing –3 carbon atoms, hydroxyalkyl containing 1–3 carbon atoms, or alkoxymethyl wherein the alkoxy contains 1–3 carbon atoms;

A′ is hydrogen or alkyl containing 1–3 carbon atoms;

A and A′ taken together with the carbon atom to which they are attached form cycloalkyl containing 3–4 carbon atoms;

Y is $-(CHR_2)_n-R_1$ or $-CHR_3R_4$;

P_1 is alkyl-substituted cycloalkyl, alkyl-substituted cycloalkenyl, alkyl-substituted bicycloalkyl or alkyl-substituted bicycloalkenyl wherein each R_1 contains at least one alkyl in the β-position of the ring, up to 7 ring carbon atoms and up to a total of 12 carbon atoms;

R_2 is H or alkyl containing 1–4 carbon atoms;

R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;

n=0 or 1; and

m=0 or 1;

and food-acceptable salts thereof.

68. The compound according to claim **1** which is N-L-aspartyl 1-amino-1-[2-(fenchyl)ethyl]cyclopropane.

4,701,553

CYCLIZED UNSATURATED KETO ACIDS

Justin C. Powell, Fairfax, Va., assignor to Texaco Inc., White, White Plains, N.Y.

Filed Jan. 28, 1983, Ser. No. 461,728

Int. Cl.⁴ C07C 59/82; C10M 1/28, 1/36

U.S. Cl. 562—504 **2 Claims**

1. A cyclized unsaturated keto acid prepared by the process which comprises cyclizing a C_{10}–C_{25} alken-2-yl dicarboxylic acid anhydride with a Lewis acid catalyst in anhydrous Friedel-Craft solvent thereby forming product cyclized unsaturated keto acid; and recovering product cyclized unsaturated keto acid.

4,701,554

PROCESS FOR THE PREPARATION OF POLYPHOSPHONIC ACID AMIDES

Hermann Kauth; Manfred Schmidt; Dieter Freitag; Udo Rudolph, all of Krefeld, and Frank Kleiner, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

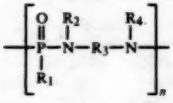
Continuation of Ser. No. 671,202, Nov. 14, 1984, abandoned. This application Dec. 10, 1985, Ser. No. 807,348

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3442637

Int. Cl.⁴ C07F 9/44, 9/65

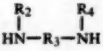
U.S. Cl. 564—14 **8 Claims**

1. A process for the production of a polymer with recurring units of the general formula



(I)

in which a diamine of the general formula



(II)

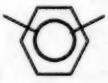
and a phosphonic acid ester of the general formula

(III)

in which, in the formulae (I) to (III):

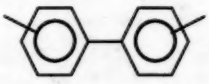
R_1 denotes C_1–C_6-alkyl, C_6–C_{15}-aryl, C_2–C_{12}-alkenyl, C_7–C_{18}-alkylaryl or C_7–C_{18}-aralkyl;

R_3 denotes one or more radicals chosen from C_2–C_{12}-alkylene; phenylene



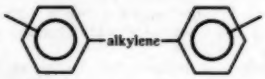
;

bisphenylene



;

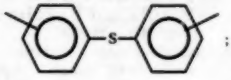
alkylene-bisphenylene



where

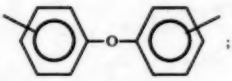
"alkylene" = C_1–C_4-alkylene, C_2–C_4-alkylidene, C_5–C_{12}-cycloalkylene or C_6–C_{12}-cycloalkylidene;

thiobisphenylene



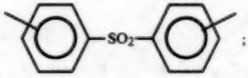
;

oxybisphenylene



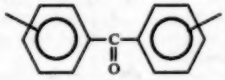
;

sulphonyl-bisphenylene

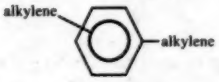


;

carbonyl-bisphenylene



and bis(alkylene)-phenylene



with 1 to 4 carbon atoms in each alkylene group; each of the phenyl nuclei of the R_1 and R_3 radicals being optionally substituted by substituents selected from 1 to 4 C_1–C_4-alkyl groups and 1 to 4 halogen atoms (Cl, Br), $R_2 = R_4$ and these radicals denote hydrogen or C_1–C_4-alkyl, or

R_2 and R_4 together denote an alkylene group which has 1 to 6 carbon atoms and links the two nitrogen atoms, in which case R_3 is restricted to alkylene with 2 to 6 carbon atoms;

Ar denotes phenyl or cresyl and

n is 3 to 20, inclusive,

are subjected to a condensation reaction with a basic catalyst in the melt at 50° to 350° C., the phenol or cresol split off being distilled off, 0.5 to 2 moles of the phosphonic acid ester of the formula (III) being used per mole of the diamine of the formula (II).

4,701,555

METHODS FOR REMOVING BIURET FROM UREA BY ADSORPTION

Donald C. Young, Fullerton, and James A. Green, II, Chino, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Jul. 10, 1985, Ser. No. 753,692
Int. Cl.[4] C07C *127/24, 126/08*
U.S. Cl. 564—38 32 Claims

1. A method for reducing the biuret content of biuret-containing urea which comprises contacting a solution or melt of said biuret-containing urea with a polar adsorbent.

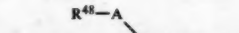
4,701,556

SUBSTITUTED CYANAMIDE COMPOUNDS USEFUL FOR THE MANUFACTURE OF CEPHALOSPORIN DERIVATIVES

Frank Loftus, Macclesfield, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

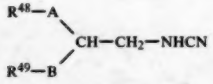
Division of Ser. No. 388,167, Jun. 14, 1982, Pat. No. 4,497,949. This application Nov. 29, 1984, Ser. No. 676,278
Claims priority, application United Kingdom, Jun. 19, 1981, 8118894
Int. Cl.[4] C07C *125/08*
U.S. Cl. 564—106 3 Claims

1. A compound of the formula IX:



IX.

2. A compound of the formula XXXIII:



XXXIII

wherein A and B are oxygen and R48 and R49, which may be the same or different, are 1–6C alkyl or 1–6C alkanoyl.

4,701,557

1,9-DIFLUORO-1,1,3,5,7,9,9-OCTANITRO-3,7-DIAZANONANE AND METHOD OF PREPARATION THEREOF

Milton B. Frankel, Tarzana, and Edward F. Witucki, Van Nuys, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 11, 1982, Ser. No. 407,198
Int. Cl.[4] C07C *111/00;* C06B *25/34*
U.S. Cl. 564—110 2 Claims

1. A compound denoted as 1,9-difluoro-1,1,3,5,5,7,9,9-octanitro-3,7-diazanonane and having the structural formula $C(NO_2)_2—\{CH_2N(NO_2)CH_2C(NO_2)_2F\}_2$.

4,701,558

METHOD FOR PURIFYING AQUEOUS ACRYLAMIDE SOLUTION

Yasumasa Yamaguchi, and Masashi Nishida, both of Kanagawa, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1985, Ser. No. 799,051
Claims priority, application Japan, Nov. 16, 1984, 59-240846
Int. Cl.[4] C07C *102/08;* C12P *13/02*
U.S. Cl. 564—127 15 Claims

1. A method for purifying an aqueous acrylamide soluton by using activated carbon, which comprises contacting activated carbon with water having oxygen dissolved therein at a concentration of at least 3 parts ppm at a space velocity of from 0.1 to 20 1/hr and until the dissolved oxygen concentration in the effluent water that has been contacted with the activated carbon increases to at least 0.5 ppm, and then contacting the aqueous acrylamide solution with the thus treated activated carbon.

5. A method as in claim 1, wherein the aqueous acrylamide solution is obtained by using a microorganisms capable of hydrating a nitrile.

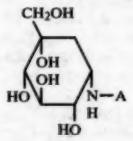
4,701,559

N-SUBSTITUTED PSEUDO-AMINOSUGARS, THEIR PRODUCTION AND USE

Satoshi Horii, Sakai; Yukihiko Kameda, Kanazawa, and Hiroshi Fukase, Osaka, all of Japan, assignors to Takeda Chemical Industries, Inc., Osaka, Japan

Filed Dec. 28, 1981, Ser. No. 334,986
Claims priority, application Japan, Jan. 5, 1981, 56-561; Jun. 2, 1981, 56-84635; Oct. 6, 1981, 56-159657
Int. Cl.[4] C07C *91/16*
U.S. Cl. 564—363 5 Claims

1. A compound of the formula:



wherein A is a chain hydrocarbon group having 1 to 10 carbon atoms which may be substituted by hydroxyl, phenoxy, thienyl, furyl, pyridyl, cyclohexyl or a phenyl which may be substituted by hydroxyl, lower alkoxy, lower alkyl or halogen group.

4,701,560

PROCESS FOR THE PREPARATION OF N-2-ALKENYL-M-TRIFLUOROMETHYLANILINES

Guy Regimbeau, Bobigny; Gérard Augelmann, and Camille Disdier, both of Lyons, all of France, assignors to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

Filed May 21, 1986, Ser. No. 865,275
Claims priority, application France, May 22, 1985, 85 07694; Oct. 25, 1985, 85 15858
Int. Cl.[4] C07C *85/04*
U.S. Cl. 564—404 17 Claims

1. A process for the preparation of N-2-alkenyl-m-trifluoromethylaniline, comprising the step of reacting an allyl halide in an aqueous medium, with a substituted or unsubstituted metatrifluoromethylaniline in the presence of (1) a compound selected from the group consisting of an alkali metal carbonate, an alkali metal hydrogen carbonate and an alkali metal hydroxide, and (2) a catalytic quantity of a tertiary amine.

4,701,561

SEPARATION OF ALDEHYDES FROM KETONES VIA ACID-CATALYZED CYCLOTRIMERIZATION OF THE ALDEHYDE

Wen-Liang Hsu, Copley, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 13, 1987, Ser. No. 25,428
Int. Cl.[4] C07C *45/78*
U.S. Cl. 568—492 10 Claims

1. A process for the separation of an aldehyde of 3 to 16 carbon atoms from a close boiling mixture, said process comprising:

(1) contacting the aldehyde containing mixture with a solid acid catalyst at a temperature from 0 to 35° C. to cyclotrimerize a major portion of the aldehyde contained in the mixture;

(2) distill the unreacted aldehyde and other components of the mixture from the high boiling cyclotrimerized aldehyde in the absence of the catalyst; and

(3) contacting the thus isolated cyclotrimerized aldehyde

with a acid catalyst at elevated temperatures to produce essentially pure aldehyde.

4,701,562

PROCESS FOR THE CONDENSATION OF ALDEHYDES

Kurt D. Olson, Cross Lanes, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 25, 1986, Ser. No. 878,201
Int. Cl.[4] C07C 45/72
U.S. Cl. 568—390 103 Claims

1. A process for condensing an aldehyde with a carbonyl compound selected from the group consisting of ketones and aldehydes, which process comprises contacting the aldehyde and the carbonyl compound with a non-zeolitic molecular sieve, the contacting of the aldehyde and the carbonyl compound with the non-zeolitic molecular sieve being effected under conditions effective to cause condensation of the aldehyde and the carbonyl compound.

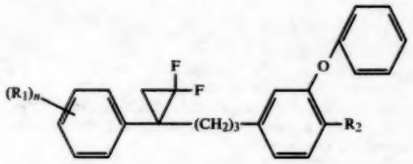
4,701,563

DIFLUOROCYCLOPROPANE DERIVATIVES AND THEIR PREPARATION, AS WELL AS PESTICIDAL COMPOSITIONS BASED ON THESE COMPOUNDS

Heinrich Franke; Hartmut Joppien, and Helga Franke, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 20, 1986, Ser. No. 841,861
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1985, 3513041
Int. Cl.[4] C07C 35/04
U.S. Cl. 568—639 19 Claims

1. Difluorocyclopropane derivatives of the general formula I



in which

R_1 is halogen, C_{1-4}-alkoxy, fluoro-substituted alkoxy, C_{1-4}-alkyl or trifluoromethyl,

R_2 is hydrogen or fluorine and

n is 0, 1 or 2.

4,701,564

PROCESS FOR THE PREPARATION OF BROMINATED DERIVATIVES OF DIPHENYL ETHER

Robert Decaudin, Pelissanne; Bernard Gurtner, Grenoble, and Andre Gagnieur, Rochetaille Sur Saone, all of France, assignors to Atochem, Puteaux, France

Filed Jul. 3, 1986, Ser. No. 881,873
Claims priority, application France, Jul. 3, 1985, 85 10161
Int. Cl.[4] C07C 41/22, 43/025
U.S. Cl. 568—639 20 Claims

1. Process for the preparation of underbrominated diphenyl ether products and upgrading these products to perbrominated diphenyl ether products, using diphenyl ether, a bromination catalyst, an organic solvent and a brominating agent, characterized that said process comprises:

(a) gradually adding a brominating agent to a first mixture comprising diphenyl ether, a bromination catalyst, and an organic solvent, the brominating agent being used in a quantity corresponding closely to the stoichiemetry, based on bromine, of the underbrominated diphenyl ether product sought;

(b) allowing the reaction to proceed to obtain a first solution of underbrominated diphenyl ether(I) impregnated with the organic solvent, and a second solution of crude solvent (II) containing underbrominated diphenyl ether (III);

(c) adding further bromination catalyst to the second solution to form a second mixture followed by the gradual addition to this second mixture of further brominating agent in molar excess in relation to the stoichiometry of the perbromination of the underbrominated diphenyl ether (III) to form a reaction medium;

(d) raising the temperature of the reaction medium obtained in c to the reflux temperature of the organic solvent and maintaining this temperature until the perbromination reaction is complete;

(e) after cooling, collecting the perbrominated diphenyl ether product (IV); and

(f) drying the underbrominated diphenyl ether product (I) and the perbrominated diphenyl ether product (IV) obtained in b and e respectively.

4,701,565

PROCESS FOR PREPARATION OF ETHERS

Masato Satomura; Ken Iwakura, both of Kanagawa, and Hiroshi Kawakami, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 12, 1986, Ser. No. 838,861
Claims priority, application Japan, Mar. 13, 1985, 60-50138; Apr. 30, 1985, 60-93329; May 14, 1985, 60-102200
Int. Cl.[4] C07C 41/16
U.S. Cl. 568—644 24 Claims

1. A process for preparing a polyether comprising reacting an alcohol which is a diol or an aryloxyalkanol with an organic sulfonyl halide in a solvent in the presence of an alkali to form a reaction mixture containing a sulfonate, and then reacting the sulfonate with a phenol, wherein the alkali is an inorganic base selected from hydroxides and carbonates of sodium and potassium, and the solvent is a polar solvent.

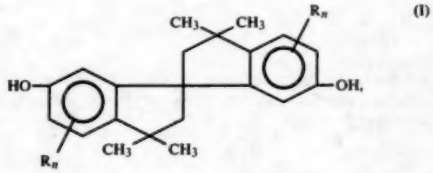
4,701,566

METHOD FOR PREPARING SPIROBIINDANE BISPHENOLS

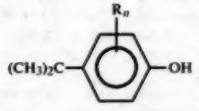
Gary R. Faler, and Jerry C. Lynch, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 10, 1986, Ser. No. 917,645
Int. Cl.[4] C07C 39/17
U.S. Cl. 568—719 20 Claims

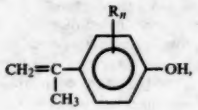
1. A method for preparing a spirobiindane bisphenol of the formula



wherein each R is independently C_{1-4} primary or secondary alkyl or halo and n is from 0 to 3, which comprises heating a mixture of (A) at least one of bisphenols of the formula

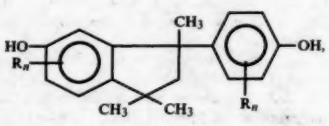


and isopropenylphenols of the formula



(III)

and (B) a 1-(4-hydroxyphenyl)indole of the formula



(IV)

wherein R and n are as previously defined, at a temperature in the range of about 100°–200° C. with an acidic catalyst selected from the group consisting of alkanesulfonic acids and polyvalent metal halides which are strong Lewis acids.

4,701,567

PROCESS FOR PRODUCING 6,6'-DIHYDROXY-3,3,3',3'-TETRAMETHYL-1,1'-SPIROBIINDANE

Yoshimitsu Tanabe, Yokohama; Keizaburo Yamaguchi, Kawasaki; Yukihiro Yoshikawa, Zushi; Kenichi Sugimoto, Yokohama, and Akihiro Yamaguchi, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

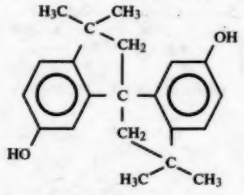
Filed Jun. 26, 1986, Ser. No. 878,687

Claims priority, application Japan, Jun. 28, 1985, 60-140406; Jul. 9, 1985, 60-149166

Int. Cl.[4] C07C *39/12*

U.S. Cl. 568—719 **7 Claims**

1. Process for producing 6,6'-dihydroxy-3,3,3',3'-tetramethyl-1,1'spirobiindane of the formula (1):



(I)

which comprises heat-treating 2,2-bis(4-hydroxyphenyl)propane at a temperature of 50° to 200° C. in the presence of a superacid-type resin.

4,701,568

PROCESS FOR PREPARING TETRABROMOBISPHENOL-A

Bonnie G. McKinnie, and Olan W. Mitchell, both of Magnolia, Ark., assignors to Ethyl Corporation, Richmond, Va.

Filed Jun. 30, 1986, Ser. No. 880,598

Int. Cl.[4] C07C *39/16, 39/367*

U.S. Cl. 568—726 **6 Claims**

1. A process for brominating bisphenol-A to make mainly tetrabromobisphenol-A while minimizing the formation of by-products, said process comprising:

(a) dissolving bisphenol-A in a C_1–C_4 alkanol in a weight ratio of about 2.0–10 parts alkanol per each part bisphenol-A,

(b) contacting the bisphenol-A solution with gaseous bromine with stirring at a reaction temperature initially of up to about 35° C. and finally at reflux, and

(c) recovering tetrabromobisphenol-A.

4,701,569

PROCESS FOR THE PREPARATION OF PERFLUOROALKYLATED ALCOHOLS AND ESTERS

Catherine Francese, L'Hay les Roses; Marc Tordeux, Sceaux, and Claude Wakselman, Paris, all of France, assignors to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

Filed May 21, 1986, Ser. No. 865,276

Claims priority, application France, May 22, 1985, 85 07696

Int. Cl.[4] C07C *33/46*

U.S. Cl. 568—812 **20 Claims**

1. A process for the perfluoroalkylation of carbonyl compounds, comprising the step of reacting a carbonyl-containing derivative with a perfluoroalkyl iodide or bromide in the presence of zinc and in the substantial absence of ultrasonic waves.

4,701,570

ANTITUMOR AGENT

Shigenobu Mizusaki, Tokyo; Daisuke Yoshida, and Yutaka Saito, both of Kawasaki, all of Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

PCT No. PCT/JP85/00609, § 371 Date Jul. 2, 1986, § 102(e) Date Jul. 2, 1986, PCT Pub. No. WO86/02835, PCT Pub. Date May 22, 1986

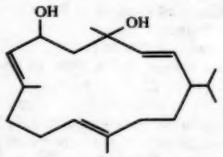
PCT Filed Nov. 1, 1985, Ser. No. 885,572

Claims priority, application Japan, Nov. 5, 1984, 59-231391

Int. Cl.[4] C07C *35/205*

U.S. Cl. 568—821 **13 Claims**

1. An antitumor agent comprising, as an active ingredient, 2,7,11-cembratriene-4,6-diol represented by the formula:



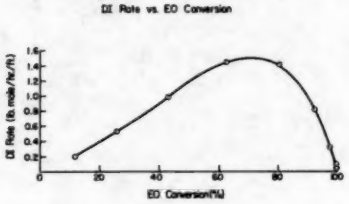
and a pharmacologically acceptable carrier for said active ingredient, such that said active ingredient is provided to a subject in orally, subcutaneously, intravenously or locally administrable form, wherein said active ingredient is present in an amount sufficient to provide a dose of 1 to 100 mg per kg of subject body weight per day.

4,701,571

PROCESS FOR THE PRODUCTION OF ALKYLENE GLYCOLS WITH METALATE-CONTAINING SOLIDS

Hwaili Soo, and John H. Robson, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 30, 1986, Ser. No. 880,032
Int. Cl.[4] C07C *31/20, 33/26, 35/14, 33/035*
U.S. Cl. 568—867 20 Claims



1. A process for the hydrolysis of alkylene oxide to produce alkylene glycol which comprises:

(a) reacting the alkylene oxide and water in the presence of a selectivity-enhancing amount of a selectivity-enhancing metalate containing solid, until about 90 percent to about 95 percent of the alkylene oxide is converted to alkylene glycol; and

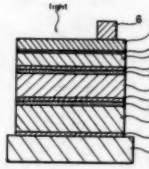
(b) completing the hydrolysis reaction of (a) in the absence of the selectivity-enhancing metalate-containing solid.

4,701,572

AMORPHOUS SOLAR CELL

Kazuhiko Sato; Genshiro Nakamura, and Takushi Itagaki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1986, Ser. No. 901,131
Claims priority, application Japan, Aug. 30, 1985, 60-192524
Int. Cl.[4] H01L *31/06, 31/18*
U.S. Cl. 136—258 8 Claims



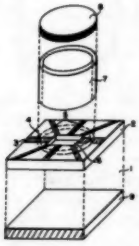
1. An amorphous solar cell including a substrate and an amorphous SiGe film which is produced by a glow discharge method, said glow discharge method utilizing a mixed gas that is obtained by mixing Si_2H_6 and GeH_4 or that is obtained by diluting Si_2H_6 and GeH_4 with a dilution gas, wherein the ratio of GeH_4 to $(Si_2H_6+GeH_4)$ in said mixed gas is from 0.1 to 0.4, whereby internal stress, exfoliation, and deterioration due to light irradiation in said solar cell are reduced.

4,701,573

SEMICONDUCTOR CHIP HOUSING

Inder J. Bahl, and Edward L. Griffin, both of Roanoke, Va., assignors to ITT Gallium Arsenide Technology Center, Roanoke, Va.

Filed Sep. 26, 1985, Ser. No. 780,494
Int. Cl.[4] H01L *23/02*
U.S. Cl. 174—52 FP 7 Claims



1. A housing for semiconductor chips to be operated at high frequency, said housing comprising:

a substrate having at least one hole therein in which a semiconductor chip can be mounted;

container means connected to and extending above said substrate for hermetically sealing said semiconductor chip; and

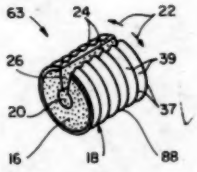
a plurality of conductive strips extending from peripheral portions of said substrate to said at least one hole, selected ones of said plurality of conductive strips having notched areas therein, said notched areas of said conductive strips exhibiting a reduced width compared to remaining portions of said selected ones of said conductive strips, said notched areas of said selected ones of said conductive strips being dimensioned to compensate for capacitive impedance present at said high frequency and loading by said container means.

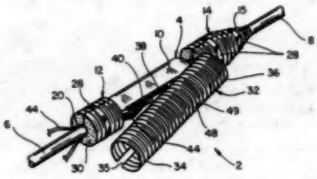
4,701,574

CABLE SEALING APPARATUS

Gerlad L. Shimirak; Thomas Hunter, both of Raleigh, N.C.; Martha F. Story, Norcross, Ga.; W. G. Halstead, Raleigh, N.C.; Paul S. Chan, San Francisco, and Christopher J. Swinmurn, Mt. View, both of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Continuation-in-part of Ser. No. 698,643, Feb. 6, 1985, abandoned. This application May 2, 1985, Ser. No. 730,697
Int. Cl.[4] H02G *15/08*
U.S. Cl. 174—93 42 Claims





1. A cable sealing apparatus, comprising:

a first end seal, the first end seal comprising:

a layer of precured gel, the gel being cured prior to contacting a cable to be sealed, the gel being elastic, conformable, having a cone penetration between 80 and 350 (10^{-1} mm), an ultimate elongation in excess of 50%, the layer of gel including means formed therein for passage of the cable to be sealed therethrough between inner and outer opposite faces of the gel, the cable to be sealed being held in contact with the gel formed means;

a convoluted member forming an outer circumferential surface of the gel, the convoluted member having a series of ridges and valleys extending circumferentially therearound;

a first member disposed adjacent to and in contact with an outer face of the gel and having means formed therein to facilitate passage of the cable to be sealed therethrough;

a second member disposed adjacent to and in contact with an inner face of the gel and having means formed therein to facilitate passage of the cable to be sealed therethrough; and

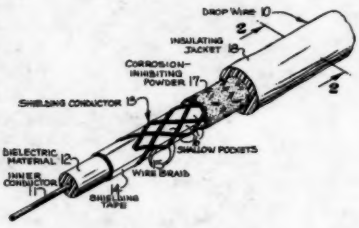
gel formed means comprising a plurality of longitudinal slits extending through the gel, a width of at least one of the slits being greater than a diameter of the cable to be sealed.

4,701,575

JACKETED CABLE WITH POWDER LAYER FOR ENHANCED CORROSION AND ENVIRONMENTAL PROTECTION

Chakra V. Gupta, and Brian D. Garrett, both of Conover, N.C., assignors to Comm/Scope Company, Catawba, N.C.

Filed May 27, 1986, Ser. No. 867,069
Int. Cl.[4] H01B *7/18, 7/28*
U.S. Cl. 174—107 **18 Claims**



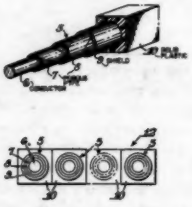
1. A corrosion-resistant cable comprising at least one metallic conductor, a polymeric insulating jacket surrounding said conductor, and a corrosion-inhibiting hydrophobic powder disposed between said metallic conductor and said insulating jacket and coating said at least one metallic conductor, said powder serving to prevent any moisture which might enter the cable from traveling longitudinally along the cable beneath said jacket in corrosive contact with said metallic conductor.

4,701,576

ELECTRICAL TRANSMISSION LINE

Toshio Wada, and Tatsuo Hirano, both of Saitama, Japan, assignors to Junkosha Co., Ltd., Japan

Filed May 23, 1986, Ser. No. 866,267
Claims priority, application Japan, Jun. 6, 1985, 60-123238
Int. Cl.[4] H01B *11/00*
U.S. Cl. 174—117 F **3 Claims**



1. An electrical transmission line comprising a center conductor, a porous plastic dielectric material disposed around the periphery of said conductor, the porous plastic dielectric material having specific gravity of 0.5 or less, and a plastic dielectric outer sheath disposed around the outer periphery of the porous plastic dielectric material, the outer sheath having a melting temperature which is 60% or less than the melting temperature of the porous plastic dielectric material, wherein said porous plastic dielectric material is expanded, porous, sintered polytetrafluoroethylene and wherein said porous plastic dielectric material is in tape form and is helically wound around said conductor at a pitch angle of 20 degrees or less with respect to the longitudinal axis of said conductor.

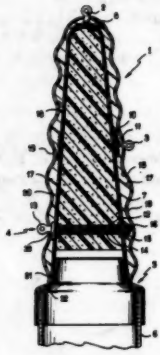
3. A multiconductor flat cable transmission line comprising a plurality of individual transmission lines, each having a rectangular cross section, bonded together at their respective interfaces, wherein each said individual transmission line comprises a center conductor, a porous plastic dielectric material disposed around the outer periphery of said conductor, the porous plastic dielectric material having specific gravity of 0.5 or less, and a plastic dielectric outer sheath disposed around the outer periphery of the porous plastic dielectric material, the outer sheath having a melting temperature which is 60% or less than the melting temperature of the porous plastic dielectric material, wherein said porous plastic dielectric material is expanded, porous, sintered polytetrafluoroethylene and wherein said porous plastic dielectric material is in tape form and is helically wound around said conductor at a pitch angle of 20 degrees or less with respect to the longitudinal axis of said conductor.

4,701,577

CABLE SUPPORT FOR AN ELECTRIC POWER-LINE POLE

Pierre Bourrieres, Cahors, France, assignor to Manufacture d'Appareillage Electrique de Cahors, Cahors, France

Filed May 22, 1986, Ser. No. 865,768
Claims priority, application France, May 28, 1985, 85 07954
Int. Cl.[4] H02G *7/20;* **E04H** *12/22*
U.S. Cl. 174—45 R **11 Claims**



1. A cable support for an electric power-line pole, comprising a body of insulating material having a core on which are mounted individual cable support brackets, the cable support being also provided with means for attaching said support to one end of a pole whilst fixing means for securing the individual cable support brackets to the core are embedded in packing material wherein the core is delimited externally by a substantially rigid shell to which are attached the individual cable support brackets and wherein the core is covered with an insulating membrane with interposition of said packing material.

4,701,578

MULTI-POSITION SELECTOR SWITCH ASSEMBY MEANS

John J. Keranen, Sussex; Scot F. Peret, Milwaukee, and David R. Stewart, Brookfield, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 7, 1986, Ser. No. 894,166
Int. Cl.[4] H01H *9/20*
U.S. Cl. 200—5 B **20 Claims**

1. A kit of parts capable of being assembled into any one of a plurality of different versions of multi-position pushbutton selector switches comprising:

an insulating switch housing adapted to be used in each version;

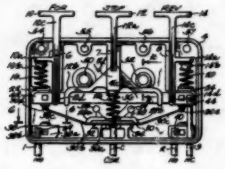
a plurality of stationary contacts adapted to be mounted in

said housing in a selected arrangement for connection to an external circuit;

a movable common contact comprising a main portion and first and second resilient contacting portions extending from said main portion, said common contact adapted to be mounted in said housing at said main portion whereby said resilient contacting portions are positioned for selectively contacting said stationary contacts; and

switch operating means comprising a selected one of two interchangable contact actuator means adapted to be mounted in said housing for operating said first and second resilient contacting portions of said movable common contact into and out of engagement with respective ones of said stationary contacts, said interchangable contact actuator means comprising:

(a) first contact actuator means comprising a plurality of momentary pushbuttons and springs associated therewith adapted to be mounted in said housing whereby



said springs bias said momentary pushbuttons to an extended position and said momentary pushbuttons are selectively depressible against said bias of said springs for directly operating said first and second resilient contacting portions of said movable common contact with respect to said stationary contacts so as to make or break desired momentary connections therebetween; or

(b) second contact actuator means comprising movable contact actuating means adapted to be mounted in said housing for engaging at least one of said first and second resilient contacting portions, a plurality of maintainable pushbuttons adapted to be mounted in said housing whereby depression of a selected maintainable pushbuttons effects operation through said contact actuating means of at least one of said first and second resilient contacting portions of said movable common contact with respect to the corresponding stationary contact, and holding means effective to maintain the selected pushbutton in its depressed position.

4,701,579

DATA ENTRY KEYBOARD

Hisao Kurachi, Okazaki; Kazuyoshi Minaminaka, Suzuka; Takeo Ito, Kuwana, and Kiyoshi Yamakawa, Gifu, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 28, 1986, Ser. No. 868,426

Claims priority, application Japan, May 29, 1985, 60-81442[U]

Int. Cl.[4] H01H *13/70*

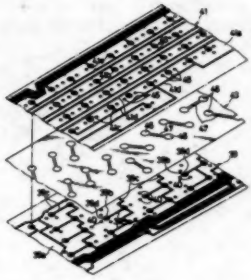
U.S. Cl. 200—5 A **4 Claims**

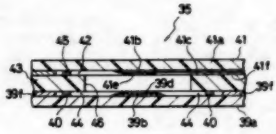
1. A data engry keyboard having a multitude of depressible keys which are selectively depressed for the entry of predetermined data, comprising:

a first substrate including stationary electrodes corresponding individually to the keys;

a flexible second substrate deformable by the depression of the keys and including movable electrodes corresponding individually to the stationary electrodes and conductor means electrically connected to the individual movable electrodes, each said conductor means being formed of an elongated main conductor strip and branch conductor strips extending from the main conductor strip and connected, at one end portion thereof, to their corresponding movable electrodes in the form of a cantilever;

an insulating member interposed between the first and second substrates and having a multitude of apertures in alignment with the stationary and movable electrodes, each said aperture having a peripheral edge provided with a first predetermined diameter, said insulating member including first ring-shaped marginal surface portions corresponding to the first substrate and second ring-shaped marginal surface portions corresponding to the second substrate, both said first and second ring-shaped marginal surface portions surrounding the respective peripheral edges of the apertures;





first spacer means located radially outside the peripheral edge of said aperture along a first circle provided with a second predetermined diameter larger than said first diameter so as to define a first void of a predetermined width between the second substrate and the second marginal surface

second spacer means located radially outside the peripheral edge of said aperture along a second circle provided with said second predetermined diameter so as to define a second void of a predetermined width between the first substrate and the first marginal surface portion, whereby said insulating member is supported at the peripheral edge portion of the aperture by said first and second spacer means in the form of a cantilever.

4,701,580

SIMULTANEOUS INTER-ROW LOCKING INHIBITING MECHANISM FOR A MULTI-ROW INTERLOCKING SWITCH DEVICE

Teiichi Miura, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed May 9, 1986, Ser. No. 861,427

Claims priority, application Japan, May 9, 1985, 60-68334[U]

Int. Cl.[4] H01H *9/26*

U.S. Cl. 200—5 E **5 Claims**

1. A multi-row interlocking switch device comprising:

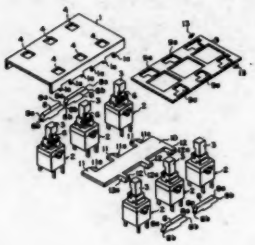
a chassis;

a plurality of rows of switches arranged in one plane of said chassis, each row having a plurality of switches, and each switch having a slide member depressable against a spring force to a depressed position, and means in said chassis for

releasably locking a slide member in the depressed position;

each slide member of each switch having an engaging portion with a downwardly tapered face formed thereon; and

a member for inhibiting the simultaneous locking of switches in two different rows in depressed positions, said inhibiting member being formed by a plate displaceably movable parallel to said plane of said chassis and having a plurality of rows of receiving portions corresponding to the rows of switches and to the number of switches in each row, wherein the receiving portions in any one row are each formed with a tapered face positioned to be engageable with the tapered face of the engaging portion of each slide member of each switch in said one row, such that depression of a slide member of any switch in said one row results in displacement of said inhibiting member in one



direction, and wherein the receiving portions of said inhibiting member for switches in a different row are positioned such that depression of a slide member of any switch in said different row results in displacement of said inhibiting member in a direction opposed to said one direction,

whereby when a slide member in one row is depressed and locked in the depressed position by said releasably locking means, said inhibiting member is displaced in said one direction and locked in the displaced position by said one locked slide member, and if it is attempted to depress a different slide member of a different row, the different slide member is locked out from being depressed by said inhibiting member being locked in the displaced position, and thereby simultaneous depression of slide members of switches in the different rows is prevented.

4,701,581

HOUSING INCLUDING A TEST BUTTON SECURED THERETO WITH A LIVING HINGE

Glen G. Wodnicki, Sterling Heights, and Carl Czarnecki, Dearborn Heights, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Sep. 15, 1986, Ser. No. 907,337

Int. Cl.[4] H01H *9/02*

U.S. Cl. 200—52 R **12 Claims**

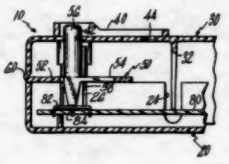
1. A housing in which electrical components may be mounted which comprises:

a cover portion;

a base portion;

means for securing the cover portion to the base portion to define a space therebetween in which components may be mounted;

a test button assembly secured by a living hinge to the cover portion, said test button assembly including a test button secured to a test button extension connected to the living hinge, said test button being partially within the space defined by the cover portion and the base portion; and



said cover portion defining an opening through which said test button may be displaced to engage an appropriate component.

4,701,582

PLUNGER SENSING SWITCH

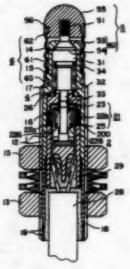
Mitsuji Hayashi, Nagaokakyo; Takashi Niwa; Akihiko Hayakawa, both of Kyoto; Hideyuki Bingo, Uji; Shoji Kazusaka, and Keisuke Konishi, both of Takatsuki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Feb. 20, 1986, Ser. No. 831,424

Claims priority, application Japan, Feb. 22, 1985, 60-34953; Feb. 28, 1985, 60-29447[U]; Mar. 4, 1985, 60-31410[U]

Int. Cl.[4] H01H *3/16*

U.S. Cl. 200—61.42 **12 Claims**



1. A switch, comprising:

a cylindrical housing having a fixed flange member formed at one end, said flange member having a conical surface,

actuator means disposed at said one end of the housing for contacting an object to be sensed by the switch,

plunger means slidably housed within the housing and slidable within said housing responsive to a displacement of the actuator means, and

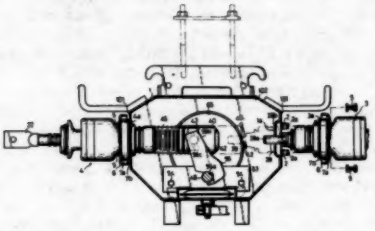
switching means in contact with the plunger means, said switching means being actuatable to switch a circuit contact means responsive to displacement of the plunger means,

said actuator means including a conical supporting member having one surface in contact with said plunger means and an opposite conical surface tiltably engageable with said conical surface of said flange member.

4,701,583
GAS SWITCH

Kunio Mitsukuchi; Hiromitsu Ito; Isamu Eguchi; Bunji Hirasato, and Takashi Furuhata, all of Inuyama, Japan, assignors to Takamatsu Electric Works, Ltd., Inuyama, Japan

Filed Mar. 10, 1986, Ser. No. 838,229
Int. Cl.⁴ H01H *33/54*
U.S. Cl. 200—148 B **23 Claims**



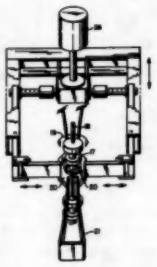
1. A gas switch comprising:
(a) a body casing having an arc-extinguishing gas such as the SF6 gas and the like confined therein and including side walls opposed to each other and having bushing through holes;
(b) bushings having their inner end portions inserted into said through holes, respectively, and having bores extending therethrough in the axial directions thereof;
(c) fixing means for fixing said bushings in said body casing in a manner to maintain the internal gas-tightness of the same such that said bushings have, in their fixed states, their respective flanges contacting with the outer surfaces of said side walls;
(d) conductors inserted into the respective through holes of said bushings and having their respective outer ends retained in the outer end portions of said bushings;
(e) a rod-shaped stationary electrode and a hollow stationary electrode attached to the respective inner end portions of said conductors and opposed in said body casing to each other;
(f) movable electrodes contacting with said rod-shaped stationary electrode at all times and made movable into and out of contact with said hollow stationary electrode;
(g) insulated bearing sleeves bearing said movable electrodes, respectively;
(h) a plurality of rocking arms for rocking in association with the turn of a drive shaft so that said movable electrodes are linearly moved through said insulated bearing sleeves by the rocking motions of said rocking arms to open and close said gas switch; and
(i) a connecting mechanism for connecting said rocking arms to said insulated bearing sleeves, respectively, said connecting mechanism including engaging grooves formed in the outer sides of said insulated bearing sleeves and opened at their sides facing said drive shaft, and engaging projections so formed in portions of said rocking arms as to directly engage with said engaging grooves and allowing in their engaging states said rocking arms to rock in said engaging grooves.

4,701,584
METHOD AND APPARATUS FOR THE INDUCTION HEAT TREATMENT OF IRREGULARLY SHAPED WORKPIECES

Edward J. Rylicki, Powell, Ohio, assignor to Industrial Electric Heating, Inc., Hilliard, Ohio

Filed May 9, 1986, Ser. No. 861,280
Int. Cl.⁴ H05B *6/10*
U.S. Cl. 219—10.57 **8 Claims**

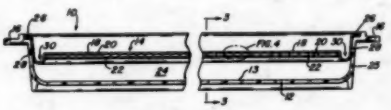
1. An apparatus for induction heat treating, by means of a circumferential flow of induced current, an elongate conducting workpiece having substantially the same cross sectional profile in cross section perpendicular to the central elongate axis of said workpiece in regions to be heat treated, comprising; (a) a single inductor carrying alternating current for induction heat treating the surface of said workpiece, said inductor comprised of a first and second half, said inductor halves having shapes complimentary to the shape of the surface of said workpiece substantially conforming to said surface over the area of said surface to be heat treated, said inductor halves positioned on opposing sides of said workpiece having the plane of current flow substantially perpendicular to said elongate axis of said workpiece, wherein the distance of said inductor halves from said workpiece can be varied in a substantially continuous manner, and wherein said first and second inductor halves are electrically connected in series in such a manner that uninterrupted current flow occurs through said first and said second inductor halves as said distance of said inductor halves from said workpiece is varied; (b) a means for accurately positioning said inductor halves in close proximity to said workpiece and in conformity to the shape thereof; (c) a means for translating said workpiece relative to said first and second inductor halves in a direction substantially perpendicular to said plane of current flow while maintaining said close proximity and said conformity of said workpiece and said inductor halves; (d) a means for accurately adjusting the rotational orientation of said workpiece about said elongate axis, in a manner coordinated with said translational position of said workpiece, so as to maintain said conformity and said close proximity of said inductor halves with the surface of said workpiece as said workpiece is translated axially relative to said inductor halves.



4,701,585
MICROWAVE BROWNING COOKWARE

James B. Stewart, Randolph, N.J., assignor to Kidde Consumer Durables Corp., Bala Cynwyd, Pa.

Filed Apr. 4, 1986, Ser. No. 848,176
Int. Cl.⁴ H05B *6/80*
U.S. Cl. 219—10.55 E **13 Claims**



1. A cookware for use in a microwave over comprising: a body of a microwave non-absorbing material and a browning portion, said browning portion having a continuous metallic cooking surface which supports the browing portion on the body, a heat absorbing portion in contact with the bottom of the cooking surface and said heat absorbing portion being made from a material having a thermal conductivity greater than said cooking surface and provided in a relatively larger

mass than said cooking surface, and a heating matrix of a microwave absorptive material in contact with the heat absorbing portion, the heating matrix adapted upon exposure to microwave radiation to create heat which is absorbed by the heat absorbing portion and retained, the heat retained by the heat absorbing portion being transferred to the cooking surface to cause a browning effect on food to be cooked.

4,701,586

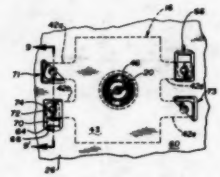
MAGNETRON MOUNTING SYSTEM

Calvin A. Hagberg, Fridley, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed May 30, 1986, Ser. No. 869,213

Int. Cl.[4] H05B 6/00

U.S. Cl. 219—10.55 R **18 Claims**



1. In a microwave oven of the type wherein a magnetron having an extending antenna is mounted exterior to an oven chamber with said antenna extending through an orifice in a planar wall of said chamber and into said chamber, the megnetron including a generally planar mounting plate having an outer face, an inner face and a hole through which said antenna extends, an improved magnetron mounting system which comprises:

(a) a plurality of clip means each including:

(i) a first leg means extending from said chamber wall at locations spaced around said orifice, and

(ii) a second leg means generally parallel with said chamber wall;

(b) a plurality of aperture means within said magnetron mounting plate, each aperture means being positioned and configured to allow a different one of said second leg means to pass therethrough and engage said plate inner face on relative rotation of said chamber wall and said magnetron mounting plate; and

(c) locking means for locking said second leg means in engagement with said plate inner face.

4,701,587

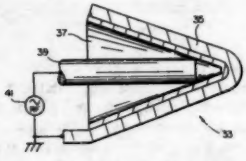
SHIELDED HEATING ELEMENT HAVING INTRINSIC TEMPERATURE CONTROL

Philip S. Carter, Palo Alto, and John F. Krumme, Woodside, both of Calif., assignors to Metcal, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 71,682, Aug. 31, 1979, Pat. No. 4,256,945. This application Mar. 16, 1981, Ser. No. 243,777

Int. Cl.[4] H05B 5/00

U.S. Cl. 219—10.75 **15 Claims**



1. A soldering iron structure comprising:

A. An alternating-current electricity resistive soldering tip having:

(1) a generally conically shaped, electrically conductive non-magnetic heating substrate member having a heat dissipation area for soldering on an exposed, generally conical surface spaced apart from an inner surface, which member is of a high thermal and high electrically conductive material having a thickness at said heat dissipation area sufficient to substantially prevent electrical current at said inner surface from penetrating through said substrate to said heat dissipation area of said exposed surface;

(2) a generally thin layer of a magnetic material covering and in good thermal and electrically conductive contact with said inner surface of said substrate which material has a maximum relative permeability greater than 1 below its Curie temperature and a minimum relative permeability of substantially 1 above its Curie temperature; and

B. an electrically conductive return stem positioned interiorly of said tip and electrically connected to an inner-most surface of said magnetic layer adjacent a first bounding edge of said heat dissipation area of said exposed surface; whereby when a source of high frequency power is electrically coupled between said stem and said tip adjacent another bounding edge of said heat dissipation area, said current is principally confined by the physical relationship of said stem to said tip to said thin magnetic layer in accordance with the skin effect at temperatures below the Curie temperature of said magnetic layer, and spreads into said non-magnetic layer as temperature rises to approach said Curie temperature and its relative permeability declines, but the thickness of said non-magnetic substrate inhibits the flow of said current to said heat dissipation area of said exposed surface of said substrate.

6. A heating structure comprising

an electrically and thermally conductive member having first and second surfaces,

a ferromagentic member having first and second surfaces with a first surface thermally and electrically coupled to said first surface of said conductive member, and

means for connecting said members in parallel across an alternating current source with a return conductor of the source disposed adjacent said second surface of said ferromagentic member,

means for substantially preventing electrical current from flowing along the second surface of said conductive member whereby to shield regions adjacent said heating structure from electromagnetic radiation,

said means for substantially preventing comprising a thickness of said conductive member equal to several skin depths, at the resistance of the conductive member and the frequency of a source employed with the heating structure when said ferromagentic material has been heated sufficiently to become essentially paramagnetic,

the source supplying sufficient energy to heat said ferromagnetic member to its Curie temperature to provide thereby autoregulation of the temperature generated by said heating structure.

4,701,588

OSCILLATION CONTROL CIRCUIT OF AN INDUCTION HEATING APPARATUS

Minoru Fukasawa, Ohtsu, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jan. 29, 1985, Ser. No. 696,245

Claims priority, application Japan, Feb. 9, 1984, 59-23729; Feb. 13, 1984, 59-24691; Feb. 13, 1984, 59-24692; Apr. 20, 1984, 59-58737; Jun. 13, 1984, 59-87659; Jun. 20, 1984, 59-126917; Jul. 17, 1984, 59-147764; Aug. 9, 1984, 59-122143; Oct. 8, 1984, 59-211001; Nov. 19, 1984, 59-243876

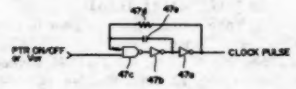
Int. Cl.[4] H05B 6/06

U.S. Cl. 219—10.77 **21 Claims**

1. In an induction heating apparatus provided with:

a rectifying circuit for rectifying an AC power source,

an induction heating coil connected to said rectifying circuit,
a resonance capacitor constituting together with said induction heating coil a resonant circuit, and
a switching element connected to said resonant circuit and allowing said resonant circuit to generate a resonance current, so that said switching element is ON/OFF controlled to allow said resonant circuit to generate said resonance current, an oscillation control circuit comprising:
a power setting circuit for setting a heating output and outputting a signal corresponding thereto as a digital power setting data signal Pref;
an on duration setting circuit which stores outputs a digital duration data signal Pcon which corresponds to the time duration during which said switching element is on in



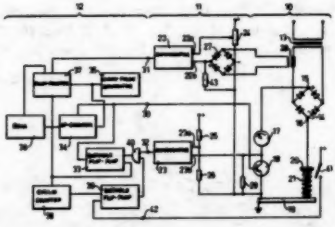
order to obtain said heating output set by said power setting circuit;
a resonance duration detecting circuit for detecting a resonance duration time period wherein a terminal voltage of said switching element is larger than a predetermined voltage after said switching element is turned off;
an overcurrent protection circuit which counts said resonance duration time period detected by said resonance duration detecting circuit and outputs digital data corresponding to the results of said counting as limiting digital data signals Icp, and
a time counter which starts time counting by turning on said switching element so that when the result of time counting coincides with said digital duration data Pcon or said limiting digital data Icp, said switching element is given an off signal.

4,701,589

METHOD AND APPARATUS FOR HEAT TREATING COILED SPRINGS

Jan S. Larsson, Spånga, Sweden, assignor to Tekno-Detaljer Lindstrom & Wærme AB, Järfälla, Sweden

Filed Oct. 10, 1985, Ser. No. 786,245
Claims priority, application Sweden, Oct. 15, 1984, 8405135
Int. Cl.[4] C21D *9/02*
U.S. Cl. 219—50 **6 Claims**



1. A method for heat treating coiled springs through subjecting each spring to a separate electrical resistance heating operation, said method comprising the steps of placing a spring between two electrodes, with opposite ends of the spring in contact under pressure against said electrodes, feeding a predetermined constant number of electric current pulses through the spring via said electrodes, each of said pulses having the general shape of a portion of a sine half wave and commencing from a initial preselected value and rising to a predetermined higher value, evaluating the amplitude of the sine half wave corresponding to each current pulse by determining the rise time of each current pulse from its initial preselected value to its predetermined higher value, and controlling the total energy supplied to the spring in dependence upon said amplitude evaluation by varying the length of each current pulse in dependence upon its rise time.

4,701,590

SPRING LOADED ELECTRODE EXPOSURE INTERLOCK DEVICE

Bruce O. Hatch, Lebanon, N.H., assignor to Thermal Dynamics Corporation, West Lebanon, N.H.

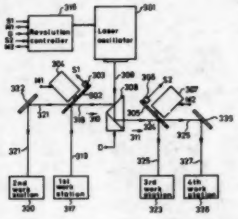
Filed Apr. 17, 1986, Ser. No. 853,029
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 PR **5 Claims**

1. A plasma-arc torch comprising:
a torch housing of electrically non-conductive material defining a chamber having an outlet opening to the exterior of said housing,
an electrically conductive mounting block within said housing defining a receptacle therein,
an electrode in said chamber at least partially conntained within and having a portion thereof in electrically contacting relation within said receptacle so as to provide a current path from said mounting block to said electrode, said electrode being adjacent to said outlet opening,
closure means removably connectable to said housing for retaining said electrode in said receptacle,
an ejector member of a length adapted to contact said electrode and movable from a first position wherein said portion of said electrode is in electrically contacting relation with said receptacle to a second position wherein said portion of said electrode is pushed out of electrically contacting relation with said receptacle thereby breaking said current path, and
spring biasing means within said torch housing normally biasing said ejector member in a direction to expel said electrode from said receptacle so that said electrode is moved out of electrical contact and electrical current from said mounting block to said electrode is interrupted when said closure means is removed from said housing.

4,701,591
APPARATUS FOR PROCESSING MULTIPLE WORKPIECES UTILIZING A SINGLE LASER BEAM SOURCE

Takeshi Masaki, Kawasaki; Koichi Kawata, Tama; Yukuo Sakagaito, Yokohama; Katsumasa Yamaguchi, Kawasaki; Hiromichi Kinoshiro, and Hiroto Toba, both of Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd, Kadoma, Japan

Filed Nov. 6, 1984, Ser. No. 668,855
Claims priority, application Japan, Nov. 7, 1983, 58-208520; Jun. 8, 1984, 59-118465; Jun. 12, 1984, 59-121176
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LT 5 Claims

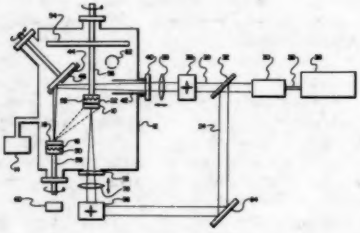


1. A laser apparatus for simultaneously processing multiple workpieces utilizing a single laser beam, comprising:
a laser oscillator to produce said laser beam;
at least one rotary chopper mirror disposed in a path of said beam, said mirror having reflective parts and beam-passage parts which sequentially are moved into said path as the mirror rotates in response to actuation of mirror rotating means, said beam being reflected towards a first workpiece when the beam strikes the reflective parts and being directed towards a second workpiece when said beam-passage parts are disposed in the path of the beam;
rotation control means for controlling rotation of said rotary chopper mirror; and
means responsive to the rotation of the rotary chopper mirror for synchronizing oscillations and interruptions in oscillations of the laser oscillator to individually control the duty ratio of the beam applied to each workpiece.

4,701,592
LASER ASSISTED DEPOSITION AND ANNEALING

Jeffrey T. Cheung, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 17, 1980, Ser. No. 207,315
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LT 13 Claims

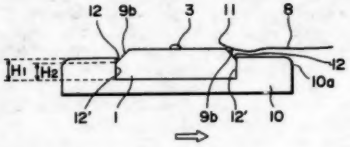


1. An apparatus for depositing a layer of a material on a substrate and annealing the deposited layer, comprising:
a vacuum chamber for connection to a vacuum source;
a source support for positioning a source of the material within said chamber in the path of a first coherent beam of light; and
a substrate support for positioning the substrate within said chamber in the path of a second coherent beam of light and located such that the substrate is offset from a normal to the source surface by a fixed distance so that the substrate is outside of a conical volume extending from the source surface and bounded by a conical surface making an angle of 45° with respect to the source normal with respect to the source so that particles ejected from the source by said first coherent beam of light in a direction making an angle of less than 45° with respect to the normal to the source surface cannot deposit on the substrate.

4,701,593
THERMAL HEAD

Soichi Hiramatsu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 635,235, Jul. 27, 1984, abandoned. This application May 12, 1986, Ser. No. 862,154
Claims priority, application Japan, Aug. 5, 1983, 58-142564
Int. Cl.[4] B41J *3/20*
U.S. Cl. 219—216 14 Claims

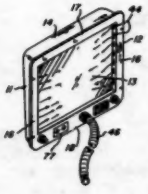


6. A thermal head comprising:
heat generating means;
electrode means connected to said heat generating means;
first support means for supporting said heat generating means and said electrode means; and
second support means having a recess deeper than a height of said first support means, wherein said first support means is received in said recess, the depth of which is dimensioned so that said heat generating means protrudes from said second support means for contact with a record paper.

4,701,594
COMBINATION MIRROR DEFOGGING AND DRYING DEVICE

Paul E. Powell, P.O. Box 674, Bloomfield, N. Mex. 87413

Continuation-in-part of Ser. No. 766,437, Aug. 16, 1985, abandoned. This application Oct. 20, 1986, Ser. No. 921,692
Int. Cl.[4] H05B *1/00*
U.S. Cl. 219—219 21 Claims



1. A combination mirror defogging and drying device comprising:
a member including a frame portion for bordering a mirror

and a housing portion containing a source of heated air, said housing portion having a pair of oppositely disposed defogging passages arranged for receiving heated air from said source and supplying heated air through at least one defogging manifold portion having a series of spaced defogging openings arranged to defog the mirror, and a drying passage in flow-receiving relation to said defogging passages having a drying opening through which heated air is discharged;

first control means for regulating the flow through said series of defogging openings from a closed position to a range of opening sizes to control the airflow over the mirror; and

second control means for regulating the flow of air from each of said defogging passages to said drying passage and for varying the airflow that is discharged from said drying opening.

4,701,595

PORTABLE HAND-HELD ELECTRIC HAIR DRYER WITH A RETRACTABLE HAND GRIP

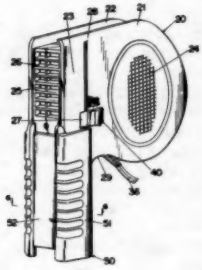
Hideo Okutsu; Koushirou Mikami, both of Hikone; Kazuyoshi Yonezawa, Suita, and Kuniharu Ichikawa, Kuze, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Oct. 24, 1985, Ser. No. 791,074

Claims priority, application Japan, Nov. 22, 1984, 59-248515

Int. Cl.[4] H05B *1/02;* **A45D** *20/12;* **F24H** *3/04*

U.S. Cl. 219—364 **8 Claims**



1. A portable hair dryer comprising:

a housing with an air outlet and an elongate front edge portion, said air outlet extending in a generally transverse direction of the front edge portion;

electrically energizable means disposed within the housing for producing and discharging a flow of heated air through the air outlet;

a hand grip slidable connected to the front edge portion so as to be longitudinally movable therealong in a straight path between a projected position in which the hand grip projects outwardly of the housing from one longitudinal end of said front edge portion and a retracted position in which the hand grip overlies the front edge portion substantially to close the air outlet;

stopper means formed on the front edge portion cooperating with means on the hand grip to prevent the hand grip from becoming disconnected from the housing; and

a recess formed in the housing at a portion adjacent to the juncture between the projected hand grip and the housing and adapted in use for receiving a portion of the user's hand grasping the hand grip;

a manually operable voltage selector for selection between a high voltage source and a low voltage source to which the hair dryer is adapted to be electrically connected for energization thereof, said voltage selector being mounted on the longitudinal end of the front edge portion from which end said hand grip projects, said voltage selector being arranged such that it is accessible only when the hand grip is in its retracted position.

4,701,596

DEVICE FOR SUPERVISING CONDITION OF ELECTRIC CONSUMERS IN A MOTOR VEHICLE

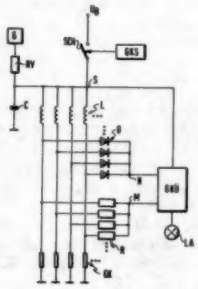
Guenter Schirmer, Ingersheim, and Gerhard Woelffing-Seelig, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 8, 1986, Ser. No. 817,044

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1985, 3500676

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—483 **7 Claims**



1. A device for monitoring condition of a plurality of direct current electric consumers in a motor vehicle including means for controlling the direct current supply to said consumers, said device comprising impedance means connected between said controlling means and respective consumers to electrically separate said consumers one from the other for alternating or pulsating current; means for feeding via said impedance means alternating or pulsating current to said consumers; means for evaluating alternating or pulsating current potentials across each of said impedance means and consumers; and means for indicating a change of said potentials due to an altered condition of at least one of said consumers; said impedance means including inductances connected in series with respective consumers; said evaluating means including a comparator for comparing said potentials at respective connection points between the series connected inductances and consumers, a plurality of diodes connected between an input of said comparator and said connection points, and a plurality of resistors connected between another input of said comparator and said connection points; and said indicating means including an indicator activated by a predetermined difference of potentials between said inputs.

4,701,597

PORTABLE CONTACT LENS DISINFECTING APPARATUS

Alan J. Braun; Lawrence M. Smith, both of Rochester, and Kelvin H. Wildman, Webster, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Aug. 11, 1986, Ser. No. 895,402

Int. Cl.[4] A61L *2/04*

U.S. Cl. 219—521 **12 Claims**

1. A thermostatically controlled heater comprising:

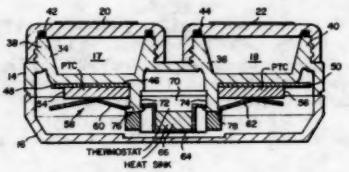
a heating chamber;

a heating element;

an electrically conductive heat sink disposed between and electrically coupled to said heating element and said heating chamber;

a thermostat for controlling said heating element;

an electrically conductive thermostat heat sink coupled mechanically and electrically to said thermostat; and



a heat transfer element connected between said heating element and said thermostat heat sink for transferring a controlled amount of heat from said heating element through said thermostat heat sink to said thermostat.

4,701,598

METHOD OF MAINTAINING PIPEWORK AND/OR STORAGE VESSELS AT PREDETERMINED PROCESS TEMPERATURE BY USING HEAT TRACING TAPE AND POWER CONTROL SYSTEM

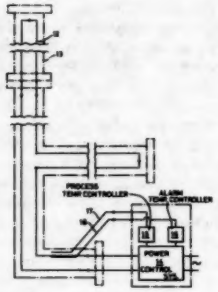
Peter J. Cooper, Southport, England, assignor to Cooperheat, Inc., Somerset, N.J.

Division of Ser. No. 599,447, Apr. 12, 1984, Pat. No. 4,575,617. This application Dec. 18, 1985, Ser. No. 810,517

Claims priority, application United Kingdom, Apr. 20, 1983, 8310747

Int. Cl.[4] H05B *3/58*

U.S. Cl. 219—535 **3 Claims**



1. A method of maintaining pipework and/or storage vessels at a predetermined process temperature by using a heat tracing tape and a power control system, the method including the steps of:

(a) providing heat tracing tape in a form which can be cut to required lengths and having a series heating element in that the tape comprises at least two lengths of woven or braided resistance wire, each of said lengths being in the form of a flat strip, said flat strips being encased in extruded insulating material whereby they are transversely spaced from one another along the length of the tape,

(b) cutting at least one length of said tape to a predetermined length,

(c) electrically connecting said strips together at one end of the tape by means of a connector,

(d) providing the tape with a termination for connection to a supply of current via said power control system,

(e) applying said tape to said pipework and/or storage vessel together with suitable insulation,

(f) determining an estimated value of power to be supplied to said tape in order to achieve a predetermined process temperature, having regard to the length of said tape and to the insulation applied to the pipework and/or storage vessel,

(g) employing said power control system to supply power to said tape, said power control system being used automatically to adjust the power supplied to said tape to said estimated value, and

(h) regulating the power supplied to said tape in accordance with a sensed temperature so as to maintain said pipework and/or storage vessel at the predetermined process temperature.

4,701,599

INSULATION SYSTEM OF SHEATHED HEATING ELEMENTS

Walter E. Miller, Brockville,, Canada, assignor to Black & Decker Inc., Newark, Del.

Filed Jun. 4, 1986, Ser. No. 870,758

Claims priority, application Canada, Jun. 27, 1985, 485704

Int. Cl.[4] H05B *3/44*; H01C *1/02*

U.S. Cl. 219—544 **9 Claims**

9. In an electric kettle, a sheathed heating element, comprising:

an outer sheath of annealed copper;

said sheath being of serpentine form and including at least one bend having a radius of curvature of the order of three eighths of an inch;

an electric resistive wire extending through said sheath and extending from the ends thereof;

a powdered insulative material being disposed and compressed between said sheath and said wire and electrically insulating said wire from said sheath;

said insulative material consisting essentially of an admixture of magnesium oxide and polydimethylsiloxane water-proofing agent; and

said polydimethylsiloxane water-proofing agent being present in the range of 0.1 to 0.15 percent by weight of the weight of the magnesium oxide.

4,701,600

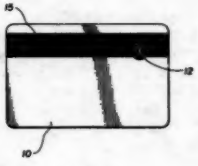
SYSTEM FOR ENTERING INITIALIZING DATA ON THE REAR FACE OF AN INTEGRATED CHIP CARD

Brian Beech, Bloomington; Jeff Rust, Brooklyn Park; Alan Mellach, Prior Lake, and Rod LeVasseur, Lakeville, all of Minn., assignors to Data Card Corporation, Minneapolis, Minn.

Filed Mar. 27, 1986, Ser. No. 844,604

Int. Cl.[4] G06K *17/00*

U.S. Cl. 235—375 **8 Claims**



1. A system for entering initializing data on an integrated chip card in which a pattern of contacts for transferring data in and out of said integrated chip card are on a face of the card, comprising in combination:

a magazine for holding a stack of integrated chip cards;

means for moving each of said integrated chip cards along a predetermined path to enter data on said integrated chip card at a plurality of data entry stations;

said moving means including means for withdrawing an integrated chip card from said stack to expose the face of the next integrated chip card in said magazine;

a head positioned adjacent said path, said head carrying a plurality of electrically conducting contacts arranged in a pattern to engage said pattern of contacts on said integrated chip card; and

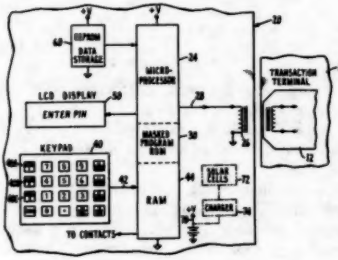
means for moving said head between a position clear of said path and a position at which the contacts on said head engage the contacts on a face of an integrated chip card which has been withdrawn from said magazine.

4,701,601

TRANSACTION CARD WITH MAGNETIC STRIPE EMULATOR

Joseph P. Francini, Castro Valley; Einar L. Asbo, Mill Valley, and Vincent Boston, San Mateo, all of Calif., assignors to Visa International Service Association, San Mateo, Calif.

Filed Apr. 26, 1985, Ser. No. 727,869
Int. Cl.[4] G06K 7/08
U.S. Cl. 235—449 **11 Claims**



1. A new transaction card having magnetic stripe emulator for use with a transaction terminal intended to interface with standard transaction cards, said standard transaction cards having a magnetic stripe formed thereon and with said terminal having a sensor means for reading transaction information encoded on the magnetic stripe on a standard card, said new card comprising:

a carrier configured to be receivable in the transaction terminal;

processor means within said carrier for generating electrical output signals;

storage means within said carrier and connected to said processor means, said storage means for holding data representative of transaction information; and

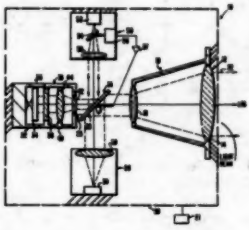
transducer means within said carrier and connected to said processor means, said transducer means for generating a varying magnetic field, extending beyond the surface of the carrier, in response to electrical output signals from said processor means, said transducer means being positioned on said carrier to be in alignment with the sensor means of the terminal when said carrier is received in the terminal, with said processor means functioning to extract said data from said storage means and generate and supply output signals to the transducer means, and with the transducer means functioning to generate a varying magnetic field readable by the sensor means in the terminal, said varying magnetic field emulating the varying magnetic field which would exist at the sensor means of the terminal if the magnetic stripe of a standard card having transaction information encoded thereon was scanned by the sensor means.

4,701,602

ADAPTABLE MODULAR STABILIZATION SYSTEM

Robert D. Schaefer, Huntington Beach, and Paul C. Kiunke, Brea, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 2, 1984, Ser. No. 636,894
Int. Cl.[4] G01J 1/20; G02B 27/64
U.S. Cl. 250—201 **11 Claims**



1. An optical path line-of-sight stabilization system for viewing a target comprising:

a housing;

means defining a first optical path and its line-of sight and having first means secured to said housing for sighting the target and obtaining information thereof and second means secured to said housing for detecting the target information;

means defining a second optical path including an inertially stabilized element secured to said housing and having a reflective surface, and a source secured to said housing for providing a beam of electromagnetic energy which is directed to and reflected from said reflective surface of said inertially stabilized element;

an adjustable beam steering mirror having first and second reflective surfaces respectively positioned in the first and second optical paths respectively between said first and second means of said first optical path means and between said source and said inertially stabilized element, said mirror first reflective surface reflecting electromagnetic energy between the target and said second means and said mirror second reflective surface directing the electromagnetic energy beam to and reflecting the electromagnetic energy beam from said inertially stabilized element; and

adjusting means coupled to said adjustable beam steering mirror and including an angle detector secured to said housing and positioned to receive the electromagnetic energy beam from said source and reflected from said reflective surface of said inertially stabilized element for responding to changes in position of said inertially stabilized element and for producing an error signal for driving said adjustable beam steering mirror and thereby for enabling substantially normal reflection and stabilization of the beam from said element reflective surface.

4,701,603

FOCUS CONTROL SYSTEM FOR OPTICAL INFORMATION RECORDER OR PLAYER

W. Ray Dakin, Huntington Beach, and John F. N. Browne, Laguna Niguel, both of Calif., assignors to Optical Disc Corporation, Cerritos, Calif.

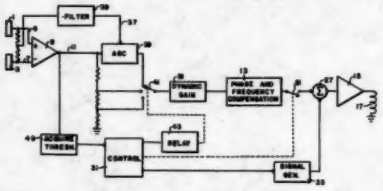
Filed Oct. 17, 1985, Ser. No. 788,479
Int. Cl.[4] H01J 40/14
U.S. Cl. 250—201 **12 Claims**

1. A focus system for controlling the position of the point of

focus of a beam of light relative to an information surface on a reflective recording medium, comprising:

focus error detection means responsive to a characteristic of the light reflected from said medium for generating a focus error signal indicative of the direction and distance between the point of focus and the information surface;

focus adjustment means responsive to said focus error signal for altering the relative position of the point of focus of



said beam along the path of said beam and toward said information surface; and

gain control means for continually controlling the gain of the focus error signal based on the reflectivity of the portion of the recording medium being impinged by said beam, whereby said gain control means increases the gain of said error signal when the reflectivity of the medium decreases.

4,701,604

OPTICAL HEAD

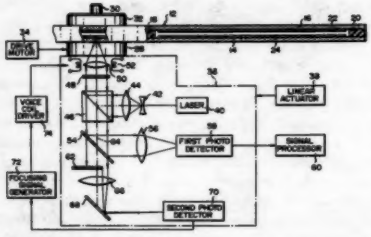
Hideo Ando, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 598,434, Apr. 9, 1984, Pat. No. 4,656,348. This application Jan. 7, 1987, Ser. No. 1,152

Claims priority, application Japan, Apr. 12, 1983, 58-64092; Jun. 30, 1983, 58-119388

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 **3 Claims**



1. An optical head for focusing light beam on a light-reflecting surface comprising:

means for generating a light beam;

means for transferring the light beam;

objective lens means for converting the transferred light beam into a convergent light beam with a beam waist, projecting the light beam on the light-reflecting surface and converging the light beam reflected from the light-reflecting surface, said objective lens means having a convergent point and an inherent maximum defocusing allowance $\pm\delta c$ with reference to the convergent point;

means for deflecting the light beam from the objective lens means, depending on the distance between the objective lens means and the light-reflecting surface; and

a photodetector having first and second photo sensitive regions and a photo insensitive region defined therebetween, said photodetector being disposed to cause a part of a beam spot to be formed on the photo insensitive region by the light beam projected on the photodetector when the objective lens is focused and a part of a beam spot to be formed on one of the photo sensitive regions by the light beam projected on the photodetector when the objective lens is defocused on the photodetector over the maximum defocusing allowance $\pm\delta c$.

4,701,605

APPARATUS AND METHOD FOR DETECTING FOCUS CONDITION OF AN IMAGING OPTICAL SYSTEM

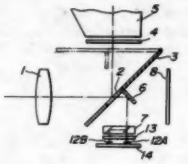
Masatoshi Ida, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Division of Ser. No. 502,546, Jun. 9, 1983. This application Feb. 12, 1986, Ser. No. 828,708

Claims priority, application Japan, Jun. 14, 1982, 57-100759; Jul. 2, 1982, 57-114915; Jul. 20, 1982, 57-126273

Int. Cl.[4] G01J *1/36*

U.S. Cl. 250—201 **5 Claims**



1. An apparatus for detecting a defocused condition of an imaging optical system comprising:

a light receiving element array disposed at or near a predetermined focal plane and having a plurality of light receiving elements;

a light flux dividing optical system arranged in the light path between the light receiving element array and the imaging optical system and constructed in such a manner that respective light flux transmitted through first and second areas of the light flux dividing optical system are divided by a plane including an optical axis of the light receiving element array upon which the light flux is incident;

means for obtaining evaluation functions F_3 and F_4, each representing an image lateral shift, by processing outputs of respective first and second light receiving element groups of the light receiving element array wherein the evaluation functions of F_3 and F_4 are obtained by the following equations:

$$F_3(F_4)=\Sigma(|A_{n+1}-B_{n-1}|-|A_n-B_{n+1}|)$$

where A_n is the output of odd numbered elements of said respective first and second light receiving element groups of the light receiving element array, and B_n is the output of even numbered elements of said respective first and second light receiving element groups of the light receiving element array; and

means for deciding the defocused condition using the evaluation functions F_3 and F_4.

4,701,606

PROJECTION OPTICAL APPARATUS

Akikazu Tanimoto, Yokohama, and Shoji Ishizaka, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 30, 1985, Ser. No. 792,764

Claims priority, application Japan, Nov. 1, 1984, 59-228914

Int. Cl.[4] H01J *40/14*

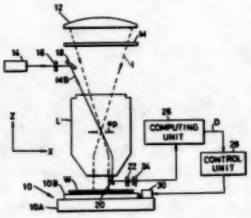
U.S. Cl. 250—201 **15 Claims**

1. A projection optical apparatus including an imaging opti-

cal system for forming an image of an object on a given plane of projection, said apparatus comprising:

(a) means for radiating a monitoring light beam toward said imaging optical system for transmission therethrough, said monitoring light beam comprising a polarized light;

(b) light receiving means for receiving said monitoring light transmitted through said imaging optical system and generating an electric signal corresponding to the quantity of said received light beam:



(c) detecting means responsive to said electric signal from said light receiving means to detect a variation of an optical characteristic of said imaging optical system; and

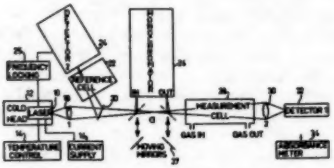
(d) means for adjusting the position of said plane of projection in accordance with said optical characteristic variation detected by said detecting means.

4,701,607

TEMPERATURE CONTROL LASER DETECTION APPARATUS

Uri El-Hanany; Uri Lachish, both of Rehovot; Shlomo Rotter, Rishon Le-Zion, and Eli Adler, Holon, all of Israel, assignors to Arel Control Systems, Ltd. and State of Israel, both of Yavne, Israel

Filed Apr. 15, 1985, Ser. No. 723,580
Int. Cl.[4] G01J *1/00;* H01S *3/13*
U.S. Cl. 250—205 **4 Claims**



1. Laser detection apparatus comprising:

a laser having an active region and providing a double beam of coherent radiation;

a sample to be tested located in a first part of said double beam of coherent radiation;

a radiation detector arranged to receive radiation passing through the sample to be tested for providing an outut indication of absorbance;

a reference sample disposed in a second part of said double beam;

means for sensing absorption of the coherent radiation at the reference sample;

means for providing selectable heating of the active region of the laser; and

means for providing a control signal to said selectable heating means in accordance with the sensed absorption of the coherent radiation at the reference sample.

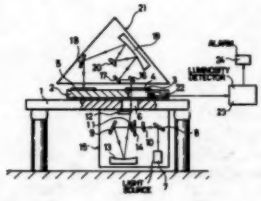
said means for providing a control signal comprising means for determining the difference between the signal intensities of said coherent radiation at the leading and trailing slopes of an absorption line characteristic of said coherent radiation and means for causing said control signal to represent both the sign and the amplitude of said difference.

4,701,608

PROJECTION ALIGNER WITH A SENSOR FOR MONITORING LIGHT QUANTITY

Koyo Morita, Higashimurayama; Keizo Nomura, Higashiyamato; Hiroshi Nishizuka, Higashikurume; Tai Hoshi, Koganei; Yoichiro Tamiya, Higashimurayama, and Terushige Asakawa, Koganei, all of Japan, assignors to Hitachi, Ltd. and Hitachi Tokyo Electronics Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 519,675, Aug. 2, 1983, Pat. No. 4,598,197. This application Jan. 29, 1986, Ser. No. 823,750
Claims priority, application Japan, Aug. 9, 1982, 57-137269
The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.
Int. Cl.[4] G01J *1/32, 1/42;* G05D *25/00*
U.S. Cl. 250—205 **21 Claims**



1. A projection aligner for transferring a pattern of a mask to a wafer to focus an image of the pattern of the mask, on the wafer, comprising:

light source means for exposing the wafer with an elongated strip-shaped exposure light thereof;

a focusing optical system for focusing the image of the pattern of the mask on the wafer with the strip-shaped light of the light source means; and

at least one sensor means for monitoring a quantity of the strip-shaped light of the light source means at a plurality of positions in or proximate to an optical path between the light source means and the wafer, so as to detect the distribution of the light in the elongated direction of the strip-shaped light at a position substantially corresponding to the mask or the wafer.

4,701,609

SEMICONDUCTOR LASER DRIVE CIRCUIT WITH PEAK DETECTION AND CONTROL

Kenji Koishi, Hyogo, and Tamotsu Matsuo, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Jul. 25, 1985, Ser. No. 758,807
Claims priority, application Japan, Jul. 27, 1984, 59-157805
Int. Cl.[4] G01V *1/32*
U.S. Cl. 250—205 **3 Claims**

1. A drive circuit for driving a semiconductor laser having a light output, comprising

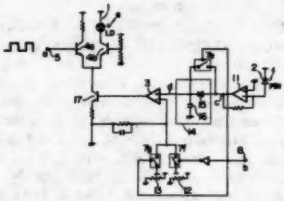
means for applying a recording signal to said semiconductor laser, the light output of said semiconductor laser being modulated by said recording signal;

a photodetector for receiving the light output of said semiconductor laser, said photodetector generating an output signal corresponding to said light output;

peak holding means coupled to the output of said photodetector for holding, during recording, the peak value of the output signal of said photodetector, said holding means

being controlled only by the output of said photodetector; and

control means coupled to the output of said holding means for applying, during recording, a control error signal to



said semiconductor laser, whereby the light output of said semiconductor laser is amplitude-modulated and has a peak value corresponding to the peak value held by said holding means.

4,701,610

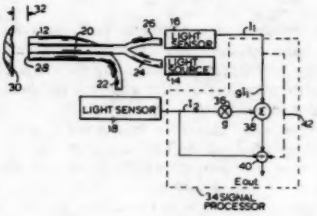
FIBER OPTIC PROXIMITY SENSORS FOR NARROW TARGETS WITH REFLECTIVITY COMPENSATION

Leo Hoogenboom, Ballston Lake, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jan. 29, 1986, Ser. No. 823,599

Int. Cl.[4] G01D *5/34*; G01J *5/16, 40/14*

U.S. Cl. 250—227 **6 Claims**



1. An optical proximity detector for determining a distance to a target moving in a preselected direction comprising:

a. a bundle of optical fibers having a face directed towards the target and including:

(1) a central portion having transmitter fibers and central receiver fibers; and

(2) an outer portion having outer receiver fibers; said central and outer portions being arranged in line with respect to said preselected direction;

b. a light source coupled to said transmitter fibers for directing light to said target;

c. a first light sensor coupled only to said central receiver fibers for sensing light reflected by the target and generating a corresponding first sensor signal I_2;

d. a second light sensor coupled only to said outer receiver fibers for sensing light reflected by the target and generating a corresponding second sensor signal I_1; and

e. signal processing means connected to said first and second light sensors and functioning to generate an output signal E indicative of said distance in accordance with said signals I_1 and I_2 wherein said output signal is generated in accordance with the formula

$$E = \frac{I_1}{I_2 + gI_1}$$

wherein g is a scaling constant determined from the response characteristics of the first and second sensors.

4,701,611

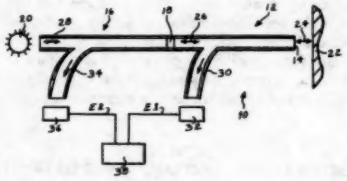
REFLECTIVITY COMPENSATED FIBER OPTIC SENSOR

Curtis D. Kissinger, Gloversville, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Sep. 30, 1985, Ser. No. 781,528

Int. Cl.[4] H01J *5/00*

U.S. Cl. 250—227 **4 Claims**



1. A fiber optic proximity detector for use in sensing the relative position of an object or change thereof, comprising:

probe means which includes a plurality of light conveying fibers which includes a group of light transmitting and at least two separate groups of light receiving fibers;

said light transmitting fibers adapted to transmit light from a light source to the object which is reflected by the object; optical splitter means;

a first group of light receiving fibers adapted to convey light reflected from the object directly to a first light detector without passing through said optical splitter means;

a second group of light receiving fibers adapted to convey light reflected from the object to a second light detector;

said optical splitter means positioned between said light transmitting fibers and said second group of light receiving fibers to allow light to pass therebetween said optical splitter means comprising an air gap and said light transmitting fibers on said air gap's nearer side to the object and to said first group of light receiving fibers not being directly aligned with said light transmitting fibers on said gap's other side but rather with said second group of receiving fibers on said gap's said other side;

said light transmitting fibers adapted also to convey light reflected by the object to the splitter means and in turn to the second group of light receiving fibers;

first and second light detectors optically coupled to the first and second groups of light receiving fibers to sense the respective light conveyed thereby, said detectors being capable of providing respective outputs corresponding to the amount of light conveyed by the respective groups of fibers; and

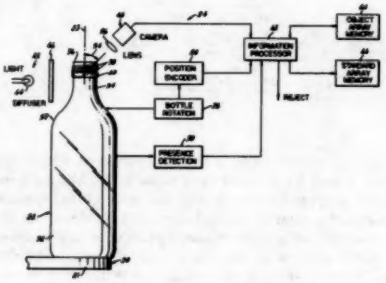
compensating means coupled to said detectors to receive the respective outputs and capable of providing an output which compensates for a change in reflectivity of the object based upon said outputs which is utilizable to determine the distance of the probe from the object.

4,701,612

INSPECTION OF CONTAINER FINISH

Dennis T. Sturgill, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 19, 1985, Ser. No. 756,539
Int. Cl.[4] G01N 21/90
U.S. Cl. 250—223 B 5 Claims



1. A method of inspecting the finish of containers having an open mouth and a central axis, said method comprising the steps of:

(a) selecting a standard container having an acceptable finish,

(b) directing diffused light energy onto the finish of said standard container while holding said container with its axis in fixed position and rotating said standard container about its axis,

(c) providing a camera which includes an array of light sensitive elements in a line coplanar with said central axis and oriented at an angle to said axis across said axis from said light source so as to view both inside and outside surfaces of said standard container finish,

(d) scanning said linear array at preselected increments of container rotation and storing in memory information indicative of intensity of light at each said element in a two-dimensioal standard data array as a function of said increments,

(e) selecting a test container having unknown finish characteristics,

(f) directing diffused light energy onto the finish of said test container while holding said test container with its axis in fixed position and rotating said test container about its axis,

(g) providing a camera which includes a linear array of light sensitive elements equal in number to elements in said camera of step (c), oriented coplanar with said axis of said test container at an angle thereto identical to said angle in step (c),

(h) scanning said linear array of step (g) at the same said preselected increments of container rotation and storing in memory information indicative of intensity of light at each said element in a two-dimensional object data array as a function of said increments,

(i) comparing information stored in said standard and object data arrays, and

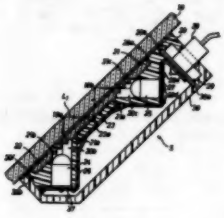
(j) providing a signal when information stored in said standard and object data arrays differs by more than a preselected threshold.

4,701,613

ELECTRO-OPTICAL RAIN DETECTOR FOR WINDSHIELDS

Takashi Watanabe; Nobuo Tsuda, both of Kariya, and Inao Tomikawa, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 12, 1985, Ser. No. 796,767
Claims priority, application Japan, Nov. 9, 1984, 59-237184
Int. Cl.[4] H01J 5/16
U.S. Cl. 250—227 8 Claims



1. An electro-optical rain detector assembly comprising:

a support block having a flat front surface attached to the internal surface of a wind-shield at a portion where the external surface of said wind-shield is wiped by a wiper blade, said support block being formed therein with a pair of spaced inclined bores opening toward the internal surface of said wind-shield;

a transparent flat plate fixedly coupled within a corresponding recess in said support block to form a common flat front surface with said support block, said transparent flat plate being formed in a rear surface thereof with a pair of spaced v-grooved portions which are opposed to the inclined bores in said support block;

a light emitting element disposed within one of the inclined bores in said support block to emit a beam of light into said wind-shield through one of the v-grooved portions of said transparent flat plate so as to cause internal reflection of the beam between the external and internal surfaces of said wind-shield; and

a light receiving element disposed within the other inclined bore in said support block to receive the incident beam reflected by the external surface of said wind-shield through the other v-grooved portion of said transparent flat plate so as to produce an electric signal indicative of an amount of the incident beam;

one of said v-grooved portions having a plurality of elongated parallel oblique planar regions disposed perpendicular to the light emission axis of said light emitting element and a plurality of elongated parallel oblique planar regions disposed in parallel with said light emission axis, and the other of said v-grooved portions having a plurality of elongated parallel oblique planar regions disposed perpendicular to the light receiving axis of said light receiving element and a plurality of elongated parallel oblique planar regions disposed in parallel with said light receiving axis.

4,701,614

FIBER OPTIC PRESSURE SENSOR

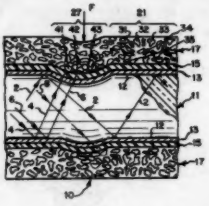
Raymond E. Jaeger, and Mohd Aslami, both of Sturbridge, Mass., assignors to Spectran Corporation, Sturbridge, Mass.

Filed Jun. 25, 1984, Ser. No. 624,259
Int. Cl.[4] H01J 5/16
U.S. Cl. 250—227 12 Claims

1. An optical fiber pressure sensor comprising:

an optically transmissive fiber,

a layer of optically lossy material concentrically clad to the optical fiber and coaxially oriented therewith, and



a compliant layer, having a dispersion of granular particles therein, concentrically clad to the lossy layer and coaxially oriented with the optical fiber.

4,701,615

MEASURING SCALE CODING SYSTEM FOR LENGTH OR ANGLE MEASURING INSTRUMENTS

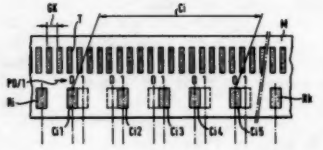
Walter Schmitt, Traunreut, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jul. 17, 1985, Ser. No. 755,928

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 3427411

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—237 G **15 Claims**



1. In a measuring instrument for measuring the relative position of two objects, of the type comprising a measuring scale extending along a measuring direction and defining a measuring graduation, a plurality of identical reference marks absolutely allocated to the graduation, a plurality of individual code marks each comprising several code mark elements for identification of the respective reference marks, a scanning unit positioned to scan the graduation, the reference marks and the code marks, and a decoding unit electrically connected to the scanning unit, the improvement comprising:

two scanning positions for each code mark element, each code mark element occupying only one of said scanning positions;

a scanning position raster comprising means for storing information indicative of the location of each occupied scanning position of each code mark element, said raster electrically connected to said decoding unit; and

means for generating a binary number in response to each code mark based upon the occupied scanning positions of each code mark element, said scanning unit, scanning positions, raster, identifying means and decoding unit cooperating to produce a unique identifying number for each code mark.

4,701,616

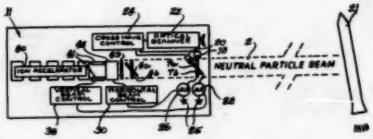
APPARATUS AND METHOD FOR AIMING A PARTICLE BEAM

William P. West, Poway, Calif., and Clifford H. Muller, III, Colorado Springs, Colo., assignors to GA Technologies Inc., San Diego, Calif.

Filed Feb. 13, 1986, Ser. No. 829,280

Int. Cl.[4] H05H *3/00*

U.S. Cl. 250—251 **11 Claims**



1. In a device for firing a beam of particles, which device includes means for generating a beam of highly accelerated particles, an apparatus for aiming said beam of highly accelerated particles at a target comprising: blocking means for blocking particles from a predetermined portion of said beam so as to create a shadow of predetermined size and shape downstream thereof; shadow detecting means for responding to particles in said beam downstream of said blocking means by producing steering signals systematically related to the blocking of particles by said blocking means; aligning means for aligning said blocking means and said shadow detecting means in a desired direction so as to make said steering signals systematically related to the direction of said beam relative to the desired direction; and aiming means for directing said particle beam to hit said target.

4,701,617

STIMULABLE PHOSPHOR SHEET CONVEYANCE APPARATUS

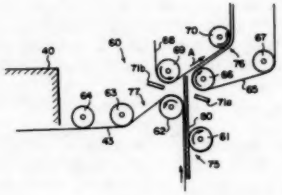
Isao Utsumi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 17, 1985, Ser. No. 788,449

Claims priority, application Japan, Oct. 20, 1984, 59-220740

Int. Cl.[4] B65H *5/00*; G01T *1/105*

U.S. Cl. 250—327.2 **8 Claims**



1. A stimulable phosphor sheet conveyance apparatus having a first conveyance path for receiving a stimulable phosphor sheet subjected to image read-out in an image read-out section and conveying the stimulable phosphor sheet in the forward direction; a third conveyance path for receiving the stimulable phosphor sheet conveyed by said first conveyance path and then conveying it in the reverse direction; a second conveyance path for receiving the stimulable phosphor sheet conveyed in the reverse direction by the third conveyance path, conveying the stimulable phosphor sheet in the same direction to an erasing section in such orientation that the stimulable phosphor side of the stimulable phosphor sheet faces erasing light sources provided in the erasing section, and, after the radiation energy remaining on the stimulable phosphor sheet

has been released in said erasing section, conveying the stimulable phosphor sheet in the forward direction to return it to the third conveyance path; wherein the improvement comprises positioning a roller for conveying the stimulable phosphor sheet at the branching point between the first conveyance path and the second conveyance path, providing the third conveyance path with a belt for guiding the stimulable phosphor sheet received from the first conveyance path to the third conveyance path, and positioning the third conveyance path to lie approximately on an imaginary straight-line extension of the second conveyance path.

4,701,618

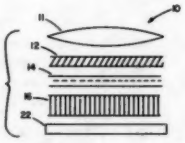
MIDDLE-INFRARED IMAGING DEVICE

Christopher H. Tosswill, Sturbridge, Mass., assignor to Galileo Electro-Optics Corp., Sturbridge, Mass.

Filed May 28, 1985, Ser. No. 738,353

Int. Cl.[4] H01L *31/14*

U.S. Cl. 250—330 **12 Claims**



1. A middle-infrared image intensifier comprising

an image-forming microchannel plate,

a thermionic emissive membrane in front of said microchannel plate, said membrane emitting electrons when exposed to middle-infrared radiation, and

a lens system to form a middle-infrared image on said membrane, said membrane being sufficiently thin and mounted to have two dimensional temperature differences develop across its surface conforming to said middle-infrared image so that electrons emitted from said membrane are emitted in an amount related to the temperature of the membrane at the position from which they are emitted and are multiplied in channels of said microchannel plate.

4,701,619

PYROELECTRIC DETECTORS

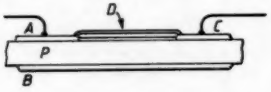
Christopher F. Carter, Wootton, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Mar. 21, 1986, Ser. No. 842,590

Claims priority, application United Kingdom, Mar. 23, 1985, 8507632

Int. Cl.[4] G01J *5/10*

U.S. Cl. 250—338 **9 Claims**



1. A pyroelectric detector element the body of which has defined on its surface at least two spaced areas exhibiting absorbing or reflecting properties to radiation to be detected, wherein the improvement lies in the element having a mirror-like area comprising a dielectric material in at least part of the space defined between said spaced areas.

4,701,620

ELECTRON BEAM EXPOSURE APPARATUS

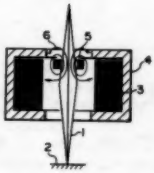
Masahide Okumura, Sagamihara; Takashi Matsuzaka, Kokubunji; Genya Matsuoka, Ome, and Norio Saitou, Iruma, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 5, 1986, Ser. No. 893,180

Claims priority, application Japan, Aug. 22, 1985, 60-183078

Int. Cl.[4] G21K *1/093*; H01J *37/07*

U.S. Cl. 250—398 **3 Claims**



1. An electron beam exposure apparatus comprising means for emitting an electron beam, an objective lens focusing the electron beam, a dynamic focus correction lens, located within said objective lens which dynamically corrects the focusing by said objective lens, and control means for controlling current supplied to said objective lens so as to cancel a current variation induced in said objective lens due to coil current of said dynamic focus correction lens.

4,701,621

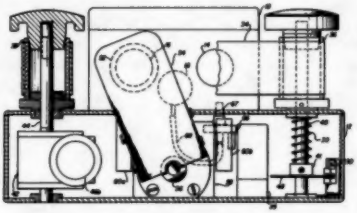
MONITOR FOR AIRBORNE RADIOACTIVE PARTICLES

Bruce J. Kaiser, Cincinnati; Edward S. Walker, Westchester, both of Ohio; George W. Tunnell, Foster City, Calif., and William Masaitis, Castle Hayne, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 10, 1986, Ser. No. 827,700

Int. Cl.[4] G01V *7/04*

U.S. Cl. 250—435 **12 Claims**



1. A radiation monitor for continuously monitoring the concentration of airborne radioactive particulate matter comprising:

an air collection chamber including a plurality of mutually spaced air inlet ports and an air outlet port;

means for maintaining said chamber at reduced pressure;

means for selectively opening a single inlet port at a time to establish an air stream therethrough into said chamber and out through said outlet port;

a particle collector positioned alongside said inlet ports for trapping airborne radioactive particles on discrete collector areas upon exposure of respective ones of said collector areas to said air stream while positioned over an open inlet port;

means for selectively advancing said collector areas past said inlet ports;

radiation detecting means;

means for selectively positioning said radiation detecting means proximate exposed, selected collector area sta-

tioned over a closed inlet port and for maintaining it in position throughout a selected time interval; and

means responsive to said radiation detecting means for counting and recording the radiation emitted by said proximate collector area;

whereby said monitor is capable of taking radiation readings on different collector areas, or of taking repeated readings on the same collector ares, to provide an integral radiation count of the ambient air.

4,701,622

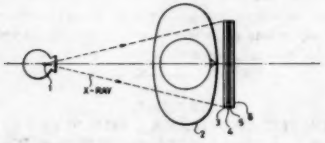
FLUORESCENT SCREEN HAVING A VARIATION IN SENSITIVITY AND METHOD OF MANUFACTURING THE SAME

Yuichiro Koizumi, Yokohama; Masaki Nojima, Urawa, and Keiji Shimiya, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha; Tappon Printing Co., Ltd.; and Kasei Optonix Ltd., all of Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,567

Int. Cl.[4] G01N *21/64*

U.S. Cl. 250—486.1 **8 Claims**



1. A fluorescent screen with varied sensitivity, comprising:

a substrate provided thereon with a first surface treatment and a second surface treatment, said first surface treatment having a first gradual variation rate of reflection starting from a first predetermined position on a surface of said substrate and varying in one direction, and said second surface treatment having a second gradual variation rate of reflection different from said first rate and starting from a second position on said surface different from said first predetermined position and varying in said one direction; and

a fluorescent layer provided on said substrate.

4,701,623

CHARGED PARTICLE BEAM APPARATUS

James P. Beasley, Tadworth, England, assignor to U.S. Philips Corporation, New York, N.Y.

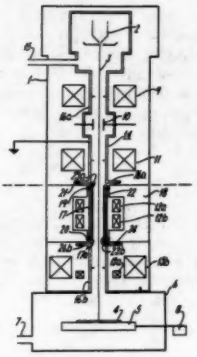
Filed Aug. 23, 1985, Ser. No. 768,581

Claims priority, application United Kingdom, Sep. 5, 1984, 8422405

Int. Cl.[4] G21K *5/04*

U.S. Cl. 250—492.2 **9 Claims**

1. In a charged particle beam apparatus comprising first means for generating a beam of charged particles, second means for directing said beam toward a target, a tube having a longitudinal bore, said bore forming a vacuum envelope, and said beam traveling through said bore, and third means disposed outside said tube for generating a variable magnetic beam deflection field for said beam within said tube, the improvement comprising said tube including a first metal section, a second metal section, and a non-conductive section containing a grounded, helically wound conductive filament disposed between said first and said second sections, said filament being closely wound, wherein eddy currents induced in said helically wound conductive filament by said variable magnetic beam deflection field are impeded between adjacent turns of said helically wound filament, and wherein said helically wound



conductive filament is connected respectively at opposite ends to said first section and said second section.

4,701,624

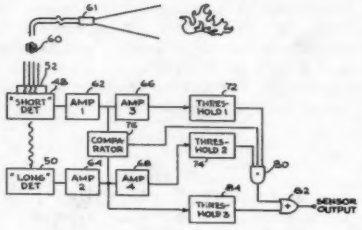
FIRE SENSOR SYSTEM UTILIZING OPTICAL FIBERS FOR REMOTE SENSING

Mark T. Kern, Goleta; Steven E. Hodges, Santa Barabara; Danny G. Snider, Ventura, and Kenneth A. Shamordola, Santa Barbara, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Oct. 31, 1985, Ser. No. 793,609

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—554 **38 Claims**



1. A dual channel fire sensor system utilizing fiber optics comprising:

a first detector for generating an electrical signal in response to short wavelength radiation incident upon the first detector;

a second detector for generating an electrical signal in response to long wavelength radiation incident upon the second detector;

a plurality of optical fibers extending from the vicinity of said first and second detectors to remote locations to be monitored for the presence of fire or explosion;

means for coupling radiation transmitted along said optical fibers to said detectors;

first and second signal channels coupled respectively to said first and second detectors for processing signals from said detectors and developing an output signal indicative of a small fire upon the correlation within a predetermined range of signals from said first and second detectors; and

a third signal channel coupled to only a selected one of said

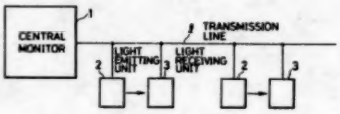
detectors and including means for developing an immediate output signal indicative of a fire in response to a predetermined large amplitude signal from the selected detector.

4,701,625

SEPARATION TYPE DETECTOR WITH ADDRESSED SELECTION

Tetsuo Kimura, Tokyo, Japan, assignor to Nittan Company, Limited, Tokyo, Japan

Filed Jul. 3, 1986, Ser. No. 881,606
Claims priority, application Japan, Sep. 2, 1985, 60-192077
Int. Cl.⁴ G01N *15/06*
U.S. Cl. 250—573 **13 Claims**



1. A separation type atmospheric detector system, comprising:

a central monitor connecting to a transmission line;

detection means connected to the transmission line for detecting an atmospheric abnormality according to changes in at least one pulse transmitted from a transmission unit to a reception unit of the detection means, said detection means sending an abnormality signal to the central monitor through said transmission line;

the transmission unit and reception unit of the detection means comprising an associated pair in proximity to one another and each of the transmission and reception units having means for assigning a same given address to each unit of the pair; and

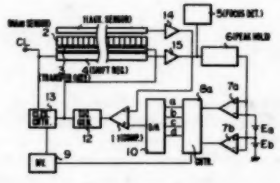
said transmission unit and reception unit each having means for being synchronously operated with respect to one another in response to a command from said central monitor.

4,701,626

ACCUMULATION TIME ADJUSTING DEVICE FOR PHOTO-ELECTRIC CONVERTER

Akira Ishizaki, Yokohama, and Kazuhiko Arakawa, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,839
Claims priority, application Japan, Sep. 30, 1983, 58-182189
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—578 **10 Claims**



4. A signal accumulation and signal reading out apparatus for repeatedly performing a signal accumulating operation for an accumulated type photo-electric converter having a plurality of pixels and repeatedly performing a reading out operation for reading out the accumulated signal, comprising:

(a) maximum detecting means for detecting the maximum of the accumulated signals of said plural pixels;

(b) average intensity detecting means for accumulating and outputting a signal corresponding to the average intensity of light incident on said photo-electric converter;

(c) control means for comparing an output from said average intensity detecting means with a reference value to terminate the signal accumulating operation when the output from said average intensity means has reached the reference value; and

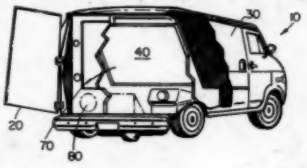
(d) adjusting means for discriminating whether or not an output from said maximum detecting means is between first and second values to change the reference value on the basis of the discriminated result so that the output from said maximum detecting means is between the first and second values.

4,701,627

MOBILE DISPLAY APPARATUS

Patrick F. Gambuti, 32 Thoreau Dr., Plainsboro, N.J. 08537, and Louis I. Martino, 2 Mansfield St., Margate, N.J. 08402

Filed Mar. 24, 1986, Ser. No. 842,911
Int. Cl.⁴ B60R *13/00*
U.S. Cl. 296—21 **13 Claims**



1. Mobile display apparatus comprising

a van having a van body enclosing its interior storage space and rear doors and a side door,

said van having a horizontal interior floor,

said van having shock absorbing and spring suspensions associated with its frame,

a console carrying electronic apparatus for displaying pictures and generating sound, said console being disposed inside said van, and

support means resiliently supporting said console adjacent to but spaced from the floor of the van

said support means comprising a rectangular frame made up of a front bar, a left bar, a right bar and a rear bar all of said bars having a flat, horizontal portion.

4,701,628

CIRCUIT FOR SUPERVISING CONTACT FOR PASSENGER PROTECTIVE DEVICE

Toru Kumasaka, Osaka; Toshikazu Ohya, and Koichi Kamiji, both of Saitama, all of Japan, assignors to NEC Home Electronics Ltd., Oska and Honda Giken Kogyo Kabushiki Kaisha, Saitama, both of, Japan

Filed Dec. 1, 1986, Ser. No. 936,358
Claims priority, application Japan, Nov. 30, 1985, 60-184763[U]
Int. Cl.⁴ B60K *28/00*
U.S. Cl. 307—9 **6 Claims**

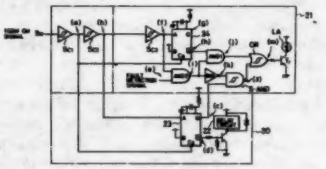
1. A circuit for supervising contact for passenger protective device in which an ignition switch, at least one collision sensor, and a detonator are connected in series to a DC power source, comprising:

at least one monitoring resistor connected in parallel to said collision sensor;

at least one monitoring switch connected in series to said monitoring resistor;

means for closing a contact of said monitoring switch with a predetermined period of delay after turning-on of said ignition switch; and

means for asserting the fact that a monitoring current flowing from the DC power source through said monitoring



resistor does not flow during said predetermined period of delay.

4,701,629

SWITCH CONTROL UNIT FOR MOTOR VEHICLE

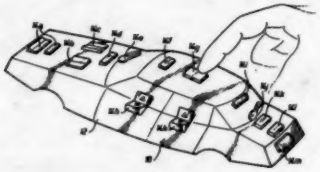
Maxime H. Citroën, 19, Villa Madrid, 92200 Neuilly-sur-Seine, France

Filed Apr. 3, 1986, Ser. No. 847,952

Claims priority, application France, Apr. 10, 1985, 85 05391

Int. Cl.[4] B60K *26/00;* **B62D** *45/00;* **G08G** *1/00;* **H01H** *9/00*

U.S. Cl. 307—10 R **16 Claims**



1. A switch assembly for an automotive vehicle, comprising:

a support having a shape that is substantially a reduced scale three dimensional reproduction of at least a portion of a vehicle, the support including a multitude of surfaces substantially geometrically corresponding to outside surfaces of a vehicle and mutually arranged to allow tactile recognition and identification of the surfaces of the support corresponding to outside surfaces of the vehicle;

means connected to the support for mounting the support on the vehicle; and

a plurality of switches mounted on the support, each switch for controlling the actuation and deactuation of one of a plurality of articles of equipment of the vehicle, and each switch being positioned on the support on a location substantially corresponding to the location of said one article of equipment on the vehicle.

10. A switch assembly according to claim **1**, wherein the automotive vehicle includes an electrical system, and the switch assembly further includes an electric connector to connect the switch assembly electrically to said electrical system.

4,701,630

LOCAL AREA NETWORK STATION CONNECTOR

Eugene J. Annunziata, Durham; James M. Faress, II, and Thomas E. Stammely, both of Cary, all of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 27, 1985, Ser. No. 749,369

Int. Cl.[4] G06F *3/00;* **H04J** *3/02*

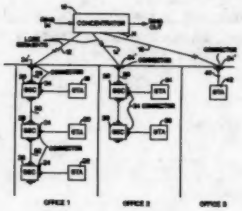
U.S. Cl. 307—112 **20 Claims**

1. A circuit arrangement for attaching office machines to a communications network comprising:

a multi-access attachment means having a plurality of independently controlled attachment modules therein with each module being responsive to enabling signals outputted from a coupled device and for switching the device into electrical communication with said network;

a plurality of connector means for conveying electrical signals therethrough;

a plurality of separate lengths of communications media with each length of communications media interconnecting one of the plurality of connector means to one of the plurality of independently controlled attachment modules, and for carrying electrical signals therebetween;



a plurality of individual lengths of communications media with each length coupled to one of said connector means; and

a plurality of single station attachment means each one coupled to one of the individual lengths of communications media said single station attachment means selectively forwarding the enabling signal from a station connected to said attachment means to one of the modules and to block the passage of enabling signals from a station not connected to said single station attachment means.

4,701,631

MONOLITHICALLY INTEGRATED CONTROL CIRCUIT FOR THE SWITCHING OF TRANSISTORS

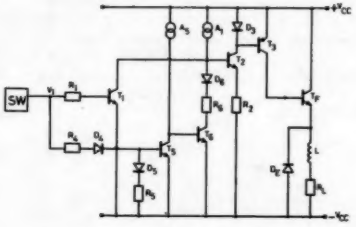
Davide Chieli, Milan, Italy, assignor to SGS Microelettronica SpA, Agrate Brianza, Italy

Filed Nov. 6, 1985, Ser. No. 795,664

Claims priority, application Italy, Nov. 7, 1984, 23464 A/84

Int. Cl.[4] H03K *17/60, 3/33;* **G05F** *1/40*

U.S. Cl. 307—254 **12 Claims**



1. A control circuit for the switching of transistors, comprising a control circuit means having at least an input terminal which is coupled to a switching signal source such that signals from said signal source cause the switching of at least one output transistor whose control terminal is coupled to an output terminal of said control circuit, said control circuit means including a current generator circuit means for supplying current to said at least one output transistor via its control terminal, and a current limiting circuit means coupled to said current generator circuit means for limiting its output current and coupled to switching signal source via a circuit delay component, wherein said current limiting circuit means is actuated by said signals from said signal source which also cause said at least one output transistor to conduct; wherein the

current supplied by said current generator circuit means is greater than a minimum amount of current necessary for control of said output transistor and wherein said current limiting circuit means is disabled by the switching off of signals from said signal source

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4,701,632

LOGIC CIRCUIT PRODUCING A DIRECT-CURRENT OUTPUT SIGNAL OF DETERMINED MAXIMUM INTENSITY

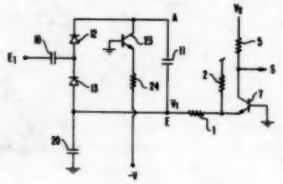
Jacquest Guillaumin, Les Lilas, France, assignor to Jeumont-Schneider Corporation, Puteaux cedex, France

Filed Mar. 7, 1986, Ser. No. 837,536

Claims priority, application France, Mar. 13, 1985, 85 03645

Int. Cl.⁴ H03K *5/08*

U.S. Cl. 307—261 **3 Claims**



1. A logic circuit for producing a direct current signal not exceeding a predetermined maximum intensity at an output terminal of said circuit in response to an alternating current signal applied to an input terminal of said circuit, regardless of the amplitude of said alternating current signal, comprising an AC to DC converter having an alternating current input to which said alternating current signal is to be applied and a direct current output which is nonreferenced to ground, a condenser connected between a positive terminal of said output of said converter and a negative terminal of said output of said converter, and a constant current generator connected between said positive terminal and ground, said negative terminal constituting said output terminal of said logic circuit.

4,701,633

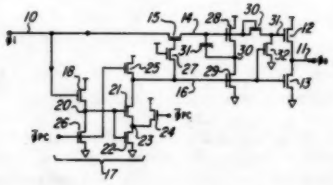
LOW POWER CLOCK GENERATOR

Jino Chun, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 30, 1985, Ser. No. 728,739

Int. Cl.⁴ H03K *5/13, 19/01, 19/003, 17/687*

U.S. Cl. 307—269 **12 Claims**



1. A clock delay circuit comprising:

an input node receiving a positive-going input clock,

an output node at which an output clock is produced having a positive-going transition delayed from said input clock by a delay period,

an output pull-up transistor and an output pull-down transistor, each of said transistors having a source-to-drain path and a gate, the source-to-drain path of said pull-up transistor connected between a positive voltage supply and said output node, the source-to-drain path of said pull-down transistor connected between said output node and reference potential,

a drive node, and coupling means connecting said input node to said drive node,

means for booting said drive node to a higher voltage above said positive voltage supply after said delay period,

delay means coupled between said input node and the gate of said output pull-down transistor to hold the voltage of said gate of said output pull-down transistor high until after said delay period,

and hold-down means connected between said drive node and said gate of the output pull-up transistor and connected to a low voltage to hold said gate of said output pull-up transistor at a low voltage until after said delay period then to allow said gate of said output pull-up transistor to be booted to said higher voltage.

4,701,634

INTEGRATED CIRCUIT FOR THE EMISSION OF A VOLTAGE WHICH ALTERNATES BETWEEN POSITIVE AND NEGATIVE VOLTAGE LEVELS

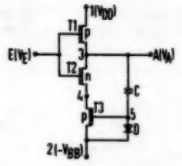
Alfred Schuetz, Zorneding; Wolfgang Müller, and Ewald Soutschek, both of Putzbrunn, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,302

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1984, 3424274

Int. Cl.⁴ H03K *19/096, 5/13, 17/687*

U.S. Cl. 307—269 **6 Claims**

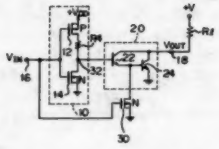


1. An integrated circuit for producing a clock voltage which alternates between a positive and a negative voltage level, comprising a voltage source with positive and negative voltage, a series circuit of first, second and third field effect transistors (T1, T2, T3) having gates with gate terminals, first and second end terminals (1, 2) of said series circuit electrically connected across said voltage source which has voltage equal to said positive and negative voltage levels, said first and second field effect transistors (T1, T2) of said series connection respectively being of first and second channel conductivity types and their gate terminals connected to a common control input (E) which receives a unipolar clock voltage, a junction point (3) between said first and second transistors connected to a circuit output terminal (A), a capacitor (C) connected between said junction point (3) and the gate of said third field effect transistor (T3) which is of a first channel conductivity type, a diode, and the gate of said third field effect transistor (T3) connected to said diode (D) and the other side of said diode connected to said second end terminal (2) of said series circuit allocated to said third field effect transistor.

4,701,635
CURRENT DRIVING CIRCUIT WITH CMOS INVERTER

Akio Kawazoe, and Satoru Inoue, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1985, Ser. No. 813,767
Claims priority, application Japan, Dec. 27, 1984, 59-276762
Int. Cl.[4] H03K *3/26, 17/60, 17/687;* **G01D** *15/10*
U.S. Cl. 307—270 **4 Claims**



1. A current driving circuit for driving a printing head of a printer comprising:

(a) a CMOS inverter composed of P and N type MOS transistors connected in series with each other, gate electrodes of said P and N type MOS transistors being connected to a signal input node, drains of said P and N type MOS transistors being connected to a signal output node, a source of said P type MOS transistor being connected to a first voltage source, a source of said N type MOS transistor being connected to ground; wherein an ON resistance of said P type MOS transistor is larger than that of said N type MOS transistor;

(b) a Darlington amplifier connected between said signal output node of said CMOS inverter and an output terminal for receiving a drive current, and composed of at least first and second NPN bipolar transistors, said first bipolar transistor having a base connected to said signal output node, an emitter, and a collector connected to said output terminal, said second bipolar transistor having a base connected to said emitter of said first bipolar transistor, an emitter connected to ground, and a collector connected to said output terminal; said output terminal being connected to a second voltage source having a higher voltage than that of said first voltage source through said printing head; and

(c) an MOS semiconductor switching means connected between said signal input node and said emitter of said first bipolar transistor of said Darlington amplifier for controlling said Darlington amplifier so as to disconnect said emitter of said first bipolar transistor from ground in a printing mode during which said signal input node is at or near a ground potential.

4,701,636
PROGRAMMING VOLTAGE CONTROL CIRCUIT FOR PROGRAMMABLE ARRAY LOGIC DEVICE

Michael S. Millhollan, Saratoga, and Chiakang Sung, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

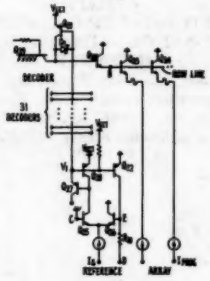
Filed May 29, 1986, Ser. No. 868,641
Int. Cl.[4] H03K *17/08*
U.S. Cl. 307—297 **8 Claims**

1. In a programmable array logic device of the type that includes a fuse array comprising a matrix of interconnecting row lines and column lines wherein each of the row lines is connected to each of the column lines by a blowable fuse such that a desired logic configuration is obtained by selectively blowing connecting fuses within the array, a control circuit connected to the fuse array for uniquely selecting a row line and for providing a programming signal thereto, the control circuit comprising:

(a) means for generating a drive signal;

(b) an array driver connected to the row line and responsive to the drive signal for providing the programming signal to the row line;

(c) row decoder means responsive to a selective input signal such that the drive signal is provided to the array driver; and

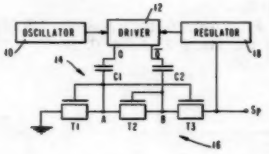


(d) reference means connected to the drive signal means for maintaining the drive signal at a predetermined magnitude.

4,701,637
SUBSTRATE BIAS GENERATORS

Ronald A. Piro, South Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1985, Ser. No. 713,668
Int. Cl.[4] H03K *3/353;* **H03L** *1/00*
U.S. Cl. 307—297 **23 Claims**



1. A substrate bias generator comprising

a semiconductor substrate,

a series circuit including first and second devices and a field effect transistor having first and second nodes connected between a point of reference potential and said substrate, said first and second devices being connected between said transistor and said point of reference potential and having a common point disposed at said second node,

a first source of potential having a first phase coupled to said first node, and

a second source of potential having a second phase out of phase with said first phase coupled to said second node,

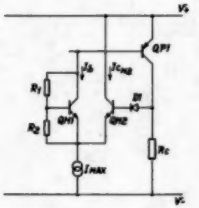
said field effect transistor having a source, a drain and a gate electrode, said transistor being connected at its source and drain between said substrate and said first node and said gate electode being connected to said second node.

4,701,638

ANTISATURATION CIRCUIT FOR INTEGRATED PNP TRANSISTOR

Fabio Marchiò , Gallarate, and Pietro Mensiti, Milan, both of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed May 7, 1986, Ser. No. 860,741
Claims priority, application Italy, Jun. 24, 1985, 21272 A/85
Int. Cl.[4] H03K 3/33
U.S. Cl. 307—300 2 Claims



1. An antisaturation circuit for an integrated PNP transistor, said PNP transistor having a current generator in the base branch capable of determining a maximum base current, an emitter connected to a common, high potential node of the circuit and a collector connected through a load to a common, low potential node of the circuit, comprising:

a first NPN transistor having an emitter, a base and a collector;

a second NPN transistor having an emitter, a base and a collector;

the emitter of said first NPN transistor and the emitter of said second NPN transistor being connected in common and to one pole of said current generator;

the other pole of said current generator being connected to said common, low potential node of the circuit;

the collector of said first NPN transistor being connected to the base of said PNP transistor constituting an input node of the circuit;

the base of said first NPN transistor being connected to an intermediate point of a voltage divider formed by at least a first resistor connected across the base and the collector of said first NPN transistor and a second resistor connected across the base and the emitter of said first NPN transistor;

the collector of said second NPN transistor being connected to said common, high potential node of the circuit;

the base of said second NPN transistor being connected to a cathode of a diode whose anode is connected to the collector of said PNP transistor constituting an output node of the circuit;

the values of said resistors forming said voltage divider biasing the base of said first NPN transistor being chosen so as to adjust the collector-emitter voltage of said first NPN transistor VCEN1 to satisfy the equation

$$V_{CEN1} = V_{BEN2} + V_{D1} - V_{CBMAX}$$

where VBEN2 is the base-emitter voltage of said second NPN transistor, VD1 is a voltage drop across said diode and VCBMAX is a desired maximum tolerable voltage between collector and base of said PNP transistor.

4,701,639

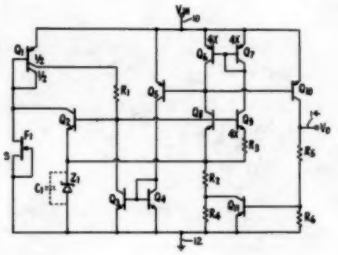
THRESHOLD DETECTOR CIRCUIT AND METHOD

Silvo Stanojevic, Milpitas, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 9, 1985, Ser. No. 806,982
Int. Cl.[4] H03K 5/153
U.S. Cl. 307—350 24 Claims

1. A threshold detector circuit for producing an output signal indicative of the relative magnitude of a detector input signal with respect to a predetermined threshold value, said circuit comprising:

reference means having an input coupled to receive said detector input signal and including first and second transistors operating at different current densities, for switching from a first state, in which said first and second transistors are substantially nonconductive, to a second state, in



which said first and second transistors conduct substantially equal currents when the magnitude of said detector input signal exceeds a predetermined reference value, said reference means being powered substantially exclusively by said detector input signal; and

sensing means for producing said output signal in response to said first and second states of said reference means.

4,701,640

ELECTRET TRANSDUCER AND METHOD OF FABRICATION

Dean W. Flygstad, Apple Valley, and Craig E. Tromborg, Bloomington, both of Minn., assignors to Telex Communications, Inc., Minneapolis, Minn.

Filed Mar. 11, 1985, Ser. No. 710,225
Int. Cl.[4] G11C 13/02
U.S. Cl. 307—400 10 Claims

1. In an electret transducer having a motor comprised of a flexible diaphragm and a flat rigid electret coated backplate disposed in spaced apart face to face relationship; spacer means disposed intermediate the diaphragm and backplate, said spacer means comprising a unitary structure having a uniform peripheral and central thickness for engaging the adjoining surfaces of the diaphragm and the backplate and operable to maintain a predetermined spacing between said diaphragm and said backplate at the center and peripheral portions thereof.

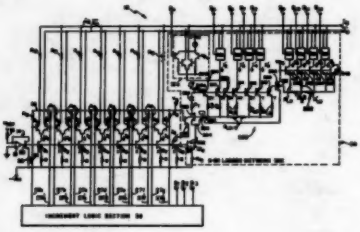
4,701,641
LOGIC NETWORK FOR D/A CONVERSION

David J. Harris, San Jose, and Charles L. Vinn, Milpitas, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 608,928, May 11, 1984, Pat. No. 4,492,954, which is a continuation of Ser. No. 334,190, Dec. 24, 1981, abandoned. This application Oct. 29, 1984, Ser. No. 665,871

Int. Cl.[4] H03K *19/20, 19/086;* G06F *7/38;* G05B *1/00*

U.S. Cl. 307—445 7 Claims



1. A logic network having a digital word comprising a plurality of bits applied thereto, such logic network comprising:

(a) a first plurality of logic gates, each one thereof being fed by at least one of the bits of the digital word, for producing a first plurality of output signals, a first portion of the first plurality of output signals representing AND logic functions of the bits of the digital word and a second portion of the first plurality of output signals representing complementary logic functions of the bits of the digital word;

(b) a plurality of current sources having matched electrical characteristics, each one of the plurality of current sources being electrically coupled to a corresponding one of the first plurality of logic gates; and

(c) a second plurality of logic gates fed by the first plurality of output signals for producing a second plurality of output signals, the second plurality of output signals being representative of NOR and OR logic functions of the first plurality of output signals.

4,701,642
BICMOS BINARY LOGIC CIRCUITS

Wilbur D. Pricer, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1986, Ser. No. 856,889

Int. Cl.[4] H03K *17/04*

U.S. Cl. 307—446 16 Claims

1. A binary logic circuit comprising

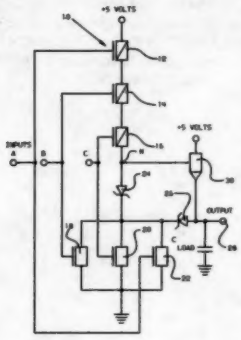
a NOR circuit having first and second N-channel transistor devices connected in parallel and first and second P-channel transistor devices connected in series and coupled between said N-channel devices and a source of potential,

a bipolar transistor having a base connected to the drain of said first P-channel device and coupled to said source of potential,

a capacitor having charge selectively stored therein and coupled to an emitter of said bipolar transistor,

means including a diode connected in series with at least one of said first and second N-channel devices for discharging substantially all charge on said capacitor through said diode and said at least one of said first and second N-channel devices to a point of reference potential,

means for applying input signals to control electrodes of said devices, and



an output terminal connected to the emitter of said transistor.

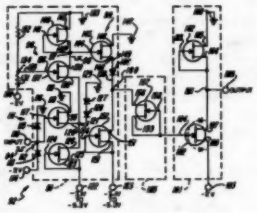
4,701,643
FET GATE CURRENT LIMITER CIRCUITS

David P. Laude, Colorado Springs, and Glenn E. Noufer, Chipita Park, both of Colo., assignors to Ford Microelectronics, Inc., Colorado Springs, Colo.

Filed Mar. 24, 1986, Ser. No. 843,166

Int. Cl.[4] H03K *17/10, 17/284, 19/003, 19/094*

U.S. Cl. 307—450 8 Claims



1. A logic circuit comprising:

input circuit means including at least one input field effect transistor (FET) having a gate for receiving an input signal and having an output terminal coupled to an intermediate node, and first means for biasing said input FET so that in response to the input signal received by said input FET the voltage at said intermediate node nominally varies in response to that of the input signal, said first biasing means providing relatively constant bias current for said input FET;

output circuit means including an output FET and second means for biasing said output FET to a high conduction or low conduction state selectively in accordance with the level of voltage applied to a gate of said output FET to produce an output signal having a nominal voltage swing, said voltage applied to said gate of said output FET tending to forward bias said output FET; and

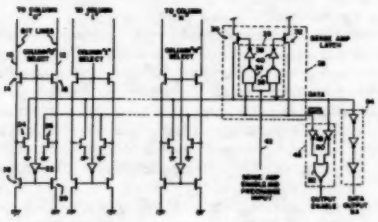
limiter means coupled between said gate of said output FET and said intermediate node for limiting the forward biasing of said output FET in response to the input signal to maintain the output voltage swing at the nominal value thereof.

4,701,644

LOW POWER SENSE AMPLIFIER

Ben Campione, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Aug. 13, 1986, Ser. No. 896,103
Int. Cl.[4] H03K 3/356, 17/16
U.S. Cl. 307—530 16 Claims



1. A sense and latch circuit for a memory device having at least a pair of bit lines, comprising:

first switching means connected to a reference level and a pair of bit lines for sensing the signal levels of said pair of bit lines;

second switching means connected by data lines to said first switching means for latching the sensed signal levels; and

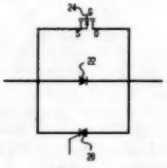
control means connected to said first and second switching means for controlling said first and second switching means such that a conductive path to said reference level through both said first and second switching means is prevented when said sensed signal levels are latched.

4,701,645

SWITCHING CIRCUIT WITH LOW CONDUCTED ELECTROMAGNETIC INTERFERENCE CHARACTERISTICS

Thomas F. W. Ferguson, New York, N.Y., assignor to Cox & Company, Inc., New York, N.Y.

Filed Jan. 24, 1985, Ser. No. 694,626
Int. Cl.[4] H03K 17/60, 5/00
U.S. Cl. 307—570 7 Claims



1. An AC switching circuit with low conducted electromagnetic interference characteristics, comprising:

a pass network including a switching element having a non-smooth conduction characteristic in a transition region about zero-crossover; and

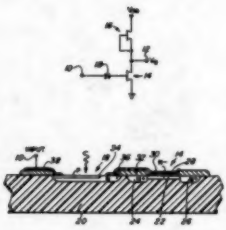
a bypass network connected in parallel with the pass network and having in said transition region a smooth conduction characteristic, the bypass network comprising a FET.

4,701,646

DIRECT COUPLED FET LOGIC USING A PHOTODIODE FOR BIASING OR LEVEL-SHIFTING

Bruce A. Richardson, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 18, 1986, Ser. No. 931,791
Int. Cl.[4] H03K 17/13, 17/687, 17/78
U.S. Cl. 307—570 17 Claims



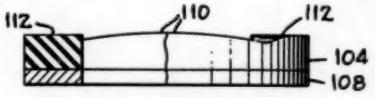
1. A circuit element comprising a first FET having its source connected to a low reference voltage and its drain connected through a second pull-up FET to a higher reference voltage, an input applied to the gate of said first FET and an output being taken from the first FET drain, the circuit element having a photodiode connected to the gate of one of the FETs, the photodiode energizable to shift the level of an input voltage applied to the gate of said one FET.

4,701,647

ELECTROMAGNETIC VIBRATORY EXCITER

Arthur L. Dean; Robert E. Kraft, and Kenneth M. Marshall, all of Indiana, Pa., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 587,724, Mar. 8, 1984, abandoned, which is a continuation-in-part of Ser. No. 352,284, Feb. 25, 1982, Pat. No. 4,455,496. This application Oct. 20, 1986, Ser. No. 921,810
Int. Cl.[4] H02K 41/00
U.S. Cl. 310—29 10 Claims



1. In an electromagnetic exciter of the type having a housing capped at opposite longitudinal ends by end caps, the end caps carrying electromagnets inside of the housing, a free mass resiliently supported on the inside of the housing and carrying armature assemblies on opposite longitudinal ends thereof, the end caps further carrying elastomeric compression means spaced apart from the opposite ends of the free mass for preventing armature strike against the electromagnets during electromagnetic conduction, an improved elastomeric compression means having a generally semi-circular outer periphery, an elongate inner periphery, end portions merging the inner and outer peripheries, a planar base surface extending between the end portions, and a contoured contact surface on the opposite side of the base surface extending between the end portions, the contoured surface having a central portion of greater height and thickness than that at the end portions.

4,701,648
CONDUCTOR WINDING ASSEMBLY FOR A GAS-COOLED ELECTRIC MACHINE

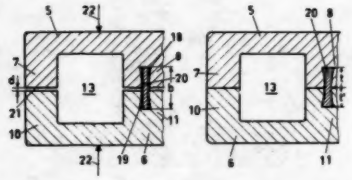
Werner Haditsch, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jun. 18, 1986, Ser. No. 875,731

Claims priority, application Switzerland, Jun. 27, 1985, 2726/85

Int. Cl.[4] H02K *1/32, 3/24*

U.S. Cl. 310—61 **11 Claims**



1. A rotor for an electric machine, said rotor comprising a rotor body (1) having at least one gas-cooled rotor winding comprising a plurality of winding conductors, said winding conductors being inserted into slots (2) in said rotor body (1), insulated from said rotor body (1), are being secured by slot wedges (3), said winding conductors being assembled from two part conductors (5,6) which are constructed to be approximately U- or E-shaped and the legs of which (7,8,9,10,11,12) are placed against each other in such a manner that at least one longitudinal duct (13,14) is formed between said two part conductors (5,6), said at least one longitudinal duct (13,14) passing completely through said rotor body (1) in the longitudinal direction, said two part conductors (5,6) being riveted together by solid riveting elements (20) disposed only in the legs (7 to 12) of said two part conductors (5,6) without intersecting the surface of said winding conductors.

4,701,649
BRUSHLESS MOTOR WITH SYMMETRICAL LEADS FOR PREVENTING SIGNAL DISTORTION

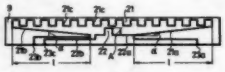
Kenji Maemine, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 4, 1986, Ser. No. 892,951

Claims priority, application Japan, Aug. 2, 1985, 60-119512[U]

Int. Cl.[4] H02K *21/24*

U.S. Cl. 310—68 R **1 Claim**



1. A brushless motor comprising:
a rotor supported rotatably having a radially extending planar surface and an outer circumferential surface;
a first magnetic member formed on the planar surface of the rotor and composed of magnetic N-poles and S-poles alternately arranged at angular intervals;
a second magnetic member extending along a first circumferential part of the circumferential surface of the rotor and composed of magnetic N-poles and S-poles alternately arranged at a smaller angular pitch than those of the first magnetic member;
a third magnetic member composed of a pair of magnetic poles located 180° opposite each other on a second circumferential part of the circumferential surface of the rotor;
stator coils formed on a stationary plane in parallel with the planar surface of the rotor and facing opposite said first magnetic member for driving the rotor in rotation when current is supplied to said coils;
a detecting substrate formed on a stationary periphery around the outer circumferential surface of the rotor, said detecting substrate having a first conductive pattern extending circumferentially opposite the rotation path of said second magnetic member in which a current signal indicating the rotational speed of the rotor is generated, and a second conductive pattern located in at least one position opposite the rotation path of said third magnetic member,
wherein said detecting substrate is provided with a pair of conductive leads which are connected to two ends of the first conductive pattern and which extend across a part of the substrate opposite the rotation path of the third magnetic member, said pair of leads being symmetrically inclined at a small angle with respect to the rotational direction of the rotor at least in said substrate part opposite the rotation path of the third magnetic member, such that distortion of the current signal generated in said first conductive pattern indicating the rotational speed of the rotor can be minimized.

4,701,650
BRUSHLESS MOTOR WITH PHASE CANCELLING LEADS FOR ROTATIONAL SPEED DETECTOR PATTERN

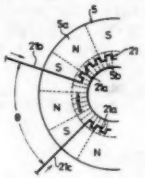
Kenji Maemine, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 4, 1986, Ser. No. 892,956

Claims priority, application Japan, Aug. 2, 1986, 60-119511[U]

Int. Cl.[4] H02K *21/24*

U.S. Cl. 310—68 R **1 Claim**



1. A brushless motor comprising:
a rotatably supported rotor having a rotor magnet provided with a main magnetizing member located at a radially outward part of the rotor and composed of magnetic N-poles and S-poles alternately arranged at angular intervals in a circumferential direction, and a subsidiary magnetizing member located at a radially inward part of the rotor and composed of magnetic N-poles and S-poles alternately arranged at a smaller angular pitch than those of the main magnetizing member;
a stationary plate facing opposite in parallel with said rotor having stator coils located opposite said magnetic poles of said main magnetizing member for driving the rotor in rotation when current is provided to said stator coils, and a substrate with a conductive pattern thereon located opposite said magnetic poles of said subsidiary magnetizing member in which a current signal indicating the rotational speed of the rotor is generated; and
a pair of leads connected to the conductive pattern on the

substrate which extend radially outward across a part of the stationary plate opposite said magnetic poles of said main magnetizing member,

wherein said pair of leads are arranged spaced apart at an angle equal to the angular interval between two consecutive magnetic poles of the same polarity of said main magnetizing member or to an integer multiple of said angular interval.

4,701,651
MOTOR UNIT

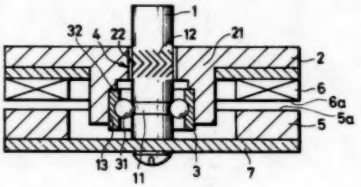
Katsuhiko Tanaka, Yamato, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,267

Claims priority, application Japan, Dec. 7, 1984, 59-184893[U]

Int. Cl.⁴ H02K 5/16

U.S. Cl. 310—90 **6 Claims**



1. A motor unit comprising:

a cylindrical shaft having an outer peripheral surface;

a member having an inner peripheral surface surrounding the outer peripheral surface of said shaft along an axial portion of said shaft

a hydrodynamic pressure type radial bearing formed between the outer peripheral surface of said shaft and the inner peripheral surface of said member;

a ball bearing including an inner race groove formed on the outer peripheral surface of said shaft, an outer race secured to the inner peripheral surface of said member and opposed to said inner race groove, and a plurality of balls disposed between said inner race groove and said outer race; and

electromagnetic driving means for causing relative rotation between said shaft and said member and for generating an attractive magnetic force which urges said shaft and said member in opposite axial directions to apply axial preload to the ball bearing.

4,701,652
DRIVE DEVICE, PARTICULARLY FOR TEXTILE MACHINES

Ernst Braun, Biberach an der Riss, Fed. Rep. of Germany, assignor to SKF-Textilmaschinen-Komponensten GmbH, Stuttgart, Fed. Rep. of Germany

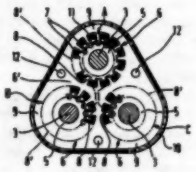
Filed Jun. 10, 1986, Ser. No. 872,598

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1985, 3520889

Int. Cl.⁴ H02K 7/20

U.S. Cl. 310—112 **7 Claims**

1. A drive device, particularly for textile machines, wherein at least two three-phase electric motors are arranged paraxially alongside each other and have single-winding stators which, are formed as a single stack of laminations, and wherein the laminations of each stator are developed integrally with the corresponding laminations of all other stators, characterized by the fact that the association of the stator winding (11) with the stator slots (7) and with the phases of the three-phase supply network is so selected for connection to all motors that like-polarity maxima of the magnetic fluxes in the yokes (9) of the stators (6) which travel in the direction of rotation of the



motor pass at different times through the location of shortest spacing between directly adjacent stators (6).

4,701,653
DISK DRIVE WITH INTERNAL BRAKE AND STATIC DISCHARGE

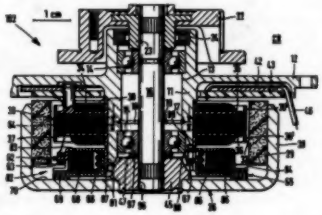
Alfred Merkle, St. Georgen; Georg Moosmann, Pennenbronn, and Rolf Müller, St. Georgen, all of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 517,793, Jul. 27, 1983, abandoned. This application Dec. 2, 1985, Ser. No. 812,273

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1982, 3227946; Jul. 27, 1982, 3227947; Jul. 27, 1982, 3227948

Int. Cl.⁴ H02K 7/102, 11/00

U.S. Cl. 310—152 **31 Claims**



19. A drive arrangement for signal-processing devices, especially disk drives, of the type including a motor whose rotor is used for direct-drive, the arrangement including:

a brushless D.C. motor comprising

(a) an internal stator,

(b) an external permanent-magnet rotor, and

(c) a motor shaft defining the rotation axis for the rotor,

(d) wherein the stator includes a carrier structure comprising an axially extending carrier pipe portion which encircles the motor shaft and accommodates at least one roller bearing unit, said motor shaft extending axially through the interior of said carrier pipe portion and being journalled within said at least one roller bearing unit, said roller bearing unit being unable to maintain said rotor and said stator at equal electric potentials,

(e) the stator further comprising a packet of stator plates radially outward of the carrier pipe portion, and a stator winding wound upon said packet of stator plates,

(f) the external permanent-magnet rotor including a rotating generally pan-shaped rotor housing comprising a peripheral wall portion having two axial ends, one axial end being located close to said radially outward extending mounting portion, the other axial end being located remote from said radially outward extending mounting portion,

(g) the rotating pan-shaped rotor housing further comprising a generally planar, generally radially extending base por-

tion located at said other axial end of said peripheral wall portion of said rotating generally pan-shaped rotor housing,

(h) the external permanent-magnet rotor further comprising an annular arrangement of permanent-magnet material located at the interior side of said peripheral wall portion and spaced radially outward from and encircling said packet of stator plates,

(i) the drive arrangement furthermore comprising an electromagnetic braking arrangement located interiorly of said generally pan-shaped rotor housing, and

(j) wherein the drive arrangement furthermore comprises electrically conductive discharge means extending between and electrically connecting together said carrier structure and said motor shaft, operative for maintaining said rotor and said stator at equal electric potentials.

4,701,654

ROTOR STRUCTURE OF MAGNETO GENERATOR

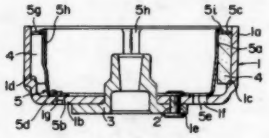
Juniti Tatukawa, Okazaki, and Shozo Kirihara, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 5, 1986, Ser. No. 871,119

Claims priority, application Japan, Jun. 6, 1985, 60-123454; Dec. 12, 1985, 60-280023; Dec. 16, 1985, 60-282235

Int. Cl.[4] H02K *15/02, 15/14*

U.S. Cl. 310—153 **15 Claims**



1. A magneto rotor including:

a generally cup-shaped casing having a perpheral wall open at one end and closed at the other end by an end wall;

a plurality of magnets disposed along an inner peripheral surface of said casing in mutually circumferentially spaced relationship with each other, said magnets being arranged to form a circumferentially discontinuous annulus having substantially cylindrical but circumferentially discontinuous inner peripheral surface having an open end communicated with and substantially coaxial with said open end of said casing, said annulus of magnets having a circumferentially discontinuous but generally annular axially outer end face adjacent to said open end of said casing; and

a magnet retainer member including a circumferentially continuous and substantially cylindrical section wedged into and extending in face-to-face pressure-contact with the inner peripheral surface of said annulus of magnets to urge them against the casing inner peripheral surface and a fixing section integral with the axially inner end of said cylindrical section and extending along and secured to said casing end wall, said magnet retainer member further including a flange section connected to the axially outer end of said cylindrical section and extending along said outer end face of said annulus of magnets in face-to-face engagement therewith to retain said magnets against axially outward removal from said casing, said magnet retainer member being formed from a thin sheet metal, said cylindrical section being provided thereon with radially outwardly deformed ridges radially aligned with and radially outwardly extending into the spaces between said magnets, respectively, the stress produced in said cylindrical section by being wedged into said annulus of magnets being concentrated in said radially outwardly deformed ridges, and said cylindrical section including an axially inner portion adjacent to said fixing section, said portion being substantially gradually reduced diametrically from the inner diameter of said annulus of magnets and converging to the axially inner end of said cylindrical section.

4,701,655

D.C. MACHINE, WITH MECHANICAL AND ELECTRICAL CONNECTIONS AMONG COLLECTOR SEGMENTS

Fritz Schmider, Hornberg, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co KG, St. Georgen, Fed. Rep. of Germany

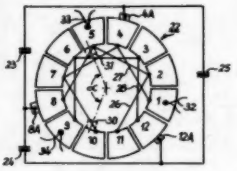
Continuation of Ser. No. 522,049, Aug. 10, 1983, Pat. No. 4,568,847. This application Dec. 2, 1985, Ser. No. 803,660

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1982, 3229744; Nov. 5, 1982, 3240826; Jul. 8, 1983, 3324617

The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.

Int. Cl.[4] H02K *23/00*

U.S. Cl. 310—237 **24 Claims**



1. A direct-current machine comprising

a stator including a stator magnet arrangement including a circumferential succession of stator poles;

a multi-coil ironless rotor arrangement mounted for rotation about a rotor axis, and including a plurality of coils arranged in a single winding layer at equiangular intervals about the rotor axis,

the rotor arrangement furthermore including a collector arrangement having a circumferential succession of collector lamellas arranged equiangularly in a circle about the rotor axis, the plurality of collector lamellas consisting of a plurality of collector lamella groups, the collector lamella groups each having the same number of collector lamellas, the individual collector lamellas of an individual collector lamella group being angularly spaced from one another in accordance with a predetermined scheme of angular spacing, said predetermined scheme of angular spacing being the same for the individual collector lamellas of each individual one of the collector lamella groups,

means for transmitting current to and from the collector lamellas and for electrically connecting together respective collector lamellas, said means including a plurality of angularly spaced brush arrangements on the stator electrically engaging predetermined respective collector lamellas in respective different angular positions of the rotor arrangement relative to the stator, said current-transmitting means furthermore including a plurality of cross-connecting means operative for causing the collector lamellas of respective collector lamella groups to be electrically connected together as successive collector lamella groups are electrically engaged by the plurality of angularly spaced brush arrangements, the plurality of cross-connecting means being provide on the rotor arrangement, with each of the cross-connecting means electrically connecting together in permanent fashion the collector lamellas of the respective one of said plurality of collector lamella groups,

one of said cross-connecting means and the collector lamellas connected by the latter being respective parts of a one-piece body of electrically conductive material.

4,701,656

ELECTROMECHANICAL DEVICE WITH SLOTTED STATOR

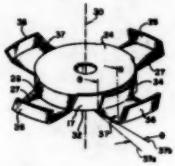
Moharram M. Fawzy, Malvern, Pa., assignor to IntraTechnology Associates, Inc., Malvern, Pa.

Continuation-in-part of Ser. No. 629,102, Jul. 9, 1984, Pat. No. 4,565,938, which is a continuation-in-part of Ser. No. 503,914, Jun. 13, 1983, Pat. No. 4,459,501. This application Jan. 17, 1986, Ser. No. 820,432

The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.[4] H02K *21/16*

U.S. Cl. 310—254 7 Claims



1. In an electromechanical device having a housing, including bearing means supporting a rotatable shaft, a magnetized disc magnet means, at least one first pole shoe positioned to contact said magnet means at a first polarity and having portions extending radially outward to define a pair of virtual pole chambers of said first polarity, at least one second pole shoe positioned to contact said magnet means at a second polarity and having portions extending radially outward to define a pair of virtual pole chambers of said second polarity, and a toroid stator mounted on said housing and having windings thereon, said stator being positoned annularly around said disc magnet means such that the virtual poles surround portions of said windings with alternating fields of polarity, the improvement comprising:

a plurality of slots in said toroid stator of sufficient depth to accommodate said windings to reduce the air gap between said pole shoes and said stator.

4,701,657

DISPERSIVE INTERDIGITAL TRANSDUCER FOR ARRANGEMENTS OPERATING WITH ACOUSTIC WAVES

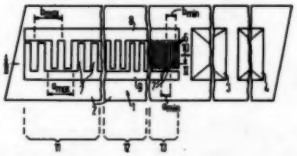
Hans-Peter Grassl, Zorneding, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 8, 1986, Ser. No. 894,664

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1985, 3529916

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—313 C 6 Claims



1. A dispersive interdigital transducer for arrangements with acoustic waves, having a split finger arrangement, and where a distribution of the finger electrodes and the dimensioning of the excitation centers is established by the finger distribution such that the dispersive interdigital transducer has a bandwidth which extends up to one or more octaves, whereby, in that part (13) of said interdigital transducer which is provided for the high frequencies (λ_{min}), the spacings a and b between neighboring excitations centers (a and $b=\lambda_{min}/2$) and the width c of the finger electrodes ($c=\lambda_{min}/8$) and the spacing clearance d of all neighboring fingers ($d=\lambda_{min}/8$) where λ_{min} is the wavelength of the highest frequencies and the corresponding dimensions in the remaining parts (11, 12) of the interdigital transducer which are respectively selectively tuned to the lower and midfrequencies of the band-width, characterized in that the spacing (d_1) of neighboring excitation centers of split fingers (16 and 17) from each other which are polarized the same is equal to the spacing d of the transducer which is provided for high frequencies and the spacings (d_2) between neighboring finger centers of the split finger pairs (16 and 17) which are polarized opposite to each other is substantially larger than d_1, the width c of the individual finger electrodes (16, 17) and the clearance (d_1) between the individual split finger electrodes (16 or, respectively, 17) of the individual split finger electrode pairs are approximately equal to the finger width c and clearance d dimensions of the part (13) of the interdigital transducer (100) provided for the high frequencies of the band-width.

4,701,658

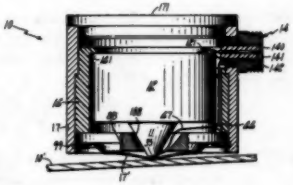
BROADBAND ACOUSTIC POINT-CONTACT TRANSDUCER

Harry I. Ringermacher, West Hartford, and Richard S. Williams, Coventry, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 710,643, Mar. 11, 1985, abandoned. This application Jan. 14, 1987, Ser. No. 6,313

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—334 8 Claims



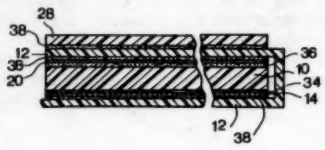
1. A broadband acoustic transducer for detecting acoustic signals and producing electrical signals representative thereof, comprising piezoelectric means including a tip of a piezoelectric material converging toward a front region thereof that is at least indirectly in contact with an acoustically active surface to be measured during a measuring operation, electrically conductive mass means for rearwardly supporting said piezoelectric means, shield means for insulatively supporting said conductive mass means and said piezoelectric means, said tip extending beyond said shield means for said contact with said acoustically active surface, and electrical means for detecting electrical signals generated in said piezoelectric means in response to the activity of said acoustically active surface, including tab means at said front region of said tip for connection to ground with an electrical wire.

4,701,659

PIEZOELECTRIC ULTRASONIC TRANSDUCER WITH FLEXIBLE ELECTRODES ADHERED USING AN ADHESIVE HAVING ANISOTROPIC ELECTRICAL CONDUCTIVITY

Tadashi Fujii; Hiroyuki Yagami, both of Fujinomiya; Iwao Seo, and Masahiro Sasaki, both of Ami, all of Japan, assignors to Terumo Corp. and Mitsubishi Petro. Co., both of Tokyo, Japan

Filed Sep. 18, 1985, Ser. No. 777,284
Claims priority, application Japan, Sep. 26, 1984, 59-199685; Oct. 27, 1984, 59-225126
Int. Cl.[4] H01E *41/08*
U.S. Cl. 310—334 8 Claims



1. An ultrasonic transducer comprising:
a piezoelectric member formed from a piezoelectric polymer material or a piezoelectric polymer composite and having a pair of main surfaces;
a first electrode bonded to one of the main surfaces of said piezoelectric member by an adhesive bond to cover substantially said one main surface;
a second electrode bonded to the other of the main surfaces of said piezoelectric member by an adhesive bond to cover substantially said other main surface;
a first lead conductor connected to said first electrode for leading said first electrode out to an external terminal;
a second lead conductor connected to said second electrode for leading said second electrode out to an external terminal;
a first flexible substrate with which said first electrode and said first lead conductor are both thinly integrally formed; and
a second flexible substrate with which said second electrode and said second lead conductor are both thinly integrally formed;
wherein said first and second electrode comprises a plurality of electrodes, and the adhesive bond between said electrodes and said piezoelectric member comprises an adhesive possessing anisotropic electrical conductivity.

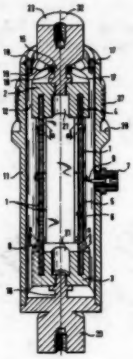
4,701,660

PIEZOELECTRIC TRANSDUCER FOR LOW FORCES

Hans-Ulrich Baumgartner, Winterthur; Reto Calderara, and Hans-Conrad Sonderegger, both of Neftenbach, all of Switzerland, assignors to Kristal Instruments AG, Winterthur, Switzerland

Filed Mar. 12, 1986, Ser. No. 838,831
Claims priority, application Switzerland, Apr. 17, 1985, 01633/85
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—338 38 Claims

1. A piezoelectric force transducer comprising
at least one elongate piezo element, said piezo element being of piezo material free from pyro effects and acting by means of a transverse piezo effect,
a force-introducing member at each end of said piezo element, and
recesses in said members for receiving said at least one piezo element, said at least one piezo element being connected directly and rigidly to said members whereby tensile or compressive forces can be transmitted to said piezo element without mechanical prestress and whereby the force



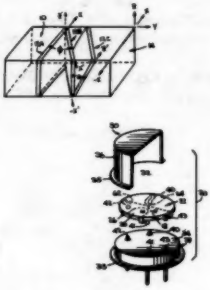
in shunt to said at least one piezo element is less than 5% in the longitudinal direction.

4,701,661

PIEZOELECTRIC RESONATORS HAVING A LATERAL FIELD EXCITED SC CUT QUARTZ CRYSTAL ELEMENT

Arthur W. Warner, Whippany, N.J., and Bruce Goldfrank, Glen Cove, N.Y., assignors to Frequency Electronics, Inc., Mitchel Field, N.Y.

Filed May 28, 1985, Ser. No. 738,697
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—360 18 Claims



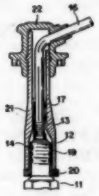
8. A piezoelectric effect resonator comprising an SC cut plate-like quartz crystal element obtained by doubly rotating a hypothetical reference blank situated in a Y quartz bar parallel to the XZ plane of the bar, the element having an X′ axis rotated approximately 22° about the Z axis and a Z′ axis rotated approximately 34° about the X′ axis, and means for applying to only one major surface of the plate-like quartz element an electric field having a field direction generally parallel to said major surface which forms a positive angle with the Z′ axis of from about 60° to about 160°.

4,701,662

SPARK PLUG CONNECTING STRUCTURE

Hidenori Yamanashi; Toshio Inada, and Seiichi Wakabayashi, all of Gotenba, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jun. 6, 1986, Ser. No. 871,277
Claims priority, application Japan, Jun. 12, 1985, 60-087621[U]
Int. Cl.[4] H01T *13/04*
U.S. Cl. 313—51 1 Claim



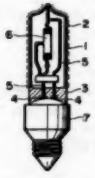
1. A spark plug connecting structure which comprises:
a spark plug having an electrode extending longitudinally thereof, said electrode having an end portion;
a porcelain insulator disposed about and fixed to said electrode and extending longitudinally therealong such that said end portion of the electrode projects from the insulator;
a bushing disposed about said porcelain insulator and sealingly fixed thereto, said bushing extending longitudinally substantially coextensively with said porcelain insulator, said bushing made of a member selected from the group consisting of a rubber, an oil-impregnated rubber and a thermosetting elastomer;
a high tension resistance cord having an end;
a plug terminal connected to said end of said high tension resistance cord, said plug terminal releasably engageable of said end portion of said electrode;
a plug cap sealingly disposed about said high tension resistance cord proximate said end of said cord, said plug cap covering said plug terminal and being releasably sealingly engageable with said bushing over the longitudinal extent of said bushing.

4,701,663

LAMP HAVING INTERFERENCE FILM

Akira Kawakatsu, Yokohama; Yooji Yuge, Chigasaki; Noriyuki Hayama, Yokohama; Tokuyoshi Saito, and Umio Maeda, both of Ichihara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 24, 1985, Ser. No. 791,110
Claims priority, application Japan, Oct. 24, 1984, 59-221942
Int. Cl.[4] H01K *1/26, 1/32*
U.S. Cl. 313—112 8 Claims



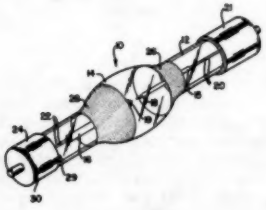
1. A lamp comprising:
a glass bulb sealing a filament therein; and
a light interference film formed on a surface of the bulb and having at least five layers, the film being formed by alternately stacking a low-refractive index layer comprising silicon oxide and a high-refractive index layer having a refractive index higher than said low-refractive index layer, said low-refractive index layer containing, at least one additive selected from the group consisting of phosphorus and boron.

4,701,664

MERCURY ARC LAMP SUITABLE FOR INCLUSION IN A FLOW CYTOMETRY APPARATUS

Roderick W. Larue, Oakland, Calif.; Werner Aebersold, Buonas, Switzerland, and Robert Eckel, Santa Clara, Calif., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jan. 9, 1986, Ser. No. 817,326
Int. Cl.[4] H01J *61/35;* G01N *21/64*
U.S. Cl. 313—112 11 Claims



1. A mercury arc lamp comprising: a glass envelope including a center portion; a cathode and an anode sealed within said envelope, the internal ends of said cathode and said anode lying in close proximity to each other within said center portion of the envelope;
an electrically conductive positive contact connected to said anode;
an electrically conductive negative contact connected to said cathode;
the interior of said envelope containing mercury and cadmium near said cathode and said anode; and
a pair of metallic-based reflective coatings around said envelope, each coating located near an internal end of the cathode and the anode, respectively, with a space between said metallic-based coatings, said space having a reflective dielectric coating thereon so that the arc between the cathode and the anode is adapted to emit ultraviolet and visible radiation through said reflective dielectric coating, but wherein said dielectric coating is adapted to reflect infrared wavelengths into the interior of said envelope.

4,701,665

COLOR CATHODE-RAY TUBE

Yoshio Suzuki, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

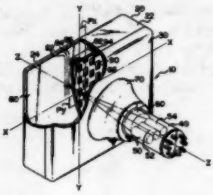
Continuation of Ser. No. 563,988, Dec. 21, 1983, abandoned. This application Mar. 7, 1986, Ser. No. 838,190
Claims priority, application Japan, Dec. 23, 1982, 57-194088[U]
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—402 8 Claims

1. A color cathode-ray tube having a tube axis, comprising:
a glass panel having a curved surface;
a fluorescent screen having a substantially rectangular shape and formed of a striped fluorescent layer, said screen being formed on the curved inner surface of said glass panel;
electron gun means for emitting electron beams toward said fluorescent screen, said gun means including a plurality of

electron guns arranged in an in-line arrangement along a horizontal axis which is perpendicular to the tube axis; and a shadow mask including:

(a) a curved effective portion having a shape similar to the inner surface of said glass panel and facing said glass panel at a short distance therefrom, said curved effective portion having a number of slit-like apertures through which the electron beams pass; and

(b) a skirt portion extending from the vicinity of said effective portion, substantially parallel to the tube axis;



wherein: (a) the radius of curvature RH of said effective portion along the horizontal axis is greater than the radius of curvature RV of the effective portion along the vertical axis and (b) wherein a horizontal pitch Px of said apertures increases in the vertical direction toward a peripheral part thereof, so that the following relationship is established between the pitch Px_0 in the vertically central part and the pitch Px_p in the vertically peripheral part: $Px_p \leqq 1.2Px_0$.

4,701,666

GROOVE AND BALL REGISTRATION SYSTEM FOR A CRT FLAT PANEL

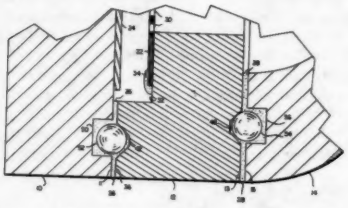
Kazimir Palac, Carpentersville, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jan. 22, 1985, Ser. No. 693,078

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

Int. Cl.[4] H01J *29/81, 29/86*

U.S. Cl. 313—407 **9 Claims**



1. A registration system for a color television picture tube comprising:

a flat glass panel adapted to receive on a surface thereof a target consisting of a mosaic of elemental colored light-emitting phosphors arranged in a predetermined pattern for selective excitation by a plurality of electron beams;

a shadow mask including a pattern of apertures for shadowing different ones of said elemental phosphors from electron beams emitted from displaced sources when said shadow mask is in a defined position between said sources and said target;

a frame for supporting and shadow mask;

two sets of three nonparallelly disposed grooves, having substantially V-shaped cross sections, one of said sets being associated with said frame and the other said set being associated with said panel to form three pairs of opposed grovoes in facing relationship when said panel and said frame are juxtaposed to each other, each of said grooves having a predetermined length, width and depth, one of said grooves in each said pair of opposed grooves having a length shorter than the length of the other of said grooves in said pair; and

three spherical members, individually positioned in an assigned one of said three pairs of opposed grooves, respectively, whereby said frame and said panel may be positioned with respect to each other with a precise repeatable registration between said target and said mask and, whereby, each of said spherical members is permitted rolling movements over limited paths within its assigned pair of opposed grooves when said frame and said panel are positioned with respect to each other.

4,701,667

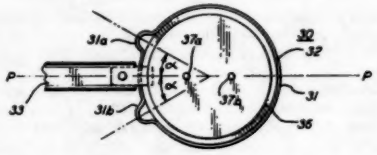
EXPANDABLE STARTING AID RING FOR FLUORESCENT LAMP

James A. Cinalli, Fairmont, W. Va., assignor to North American Philips Corporation, New York, N.Y.

Filed Mar. 17, 1986, Ser. No. 640,255

Int. Cl.[4] H01J *61/54*

U.S. Cl. 313—594 **3 Claims**



1. A discharge lamp comprising an elongated bulb, the bulb shaped so that its ends are substantially closer together than if the bulb were straight, a pair of electrodes inside the bulb near the ends of the bulb, a fill of materials inside the bulb capable of sustaining a gaseous discharge and producing a luminous output, and at least two starting aids surrounding the outer surface of the bulb in the vicinity of the electrodes, an electrically conductive support means extending between the bulb ends for electrically interconnecting the starting aids and for supporting the ends of the bulb,

each starting aid comprising a ring of electrically conducting spring material, the ring including at least two U-shaped expandable upstanding bends, the bends located on opposite sides of a plane lying in the central axis of the lamp to form an angle of less than about 60 degrees with the plane, the height of the bends being from 10 to 20 percent of the diameter of the ring, and the width of the bends being from about 0.5 to 2 times the height of the bends.

4,701,668

CYLINDRICAL IMAGE PICKUP TUBE HAVING ELECTROSTATIC DEFLECTION ELECTRODES FORMED OF STRAIGHT LINE PATTERN YOKES

Kentaro Oku, Kokubunji; Masakazu Fukushima, Tokyo; Hitomi Suzuki, Akishima, and Masanori Maruyama, Kokubunji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed May 27, 1986, Ser. No. 867,155

Claims priority, application Japan, May 27, 1985, 60-112018

Int. Cl.[4] H01J *29/70*

U.S. Cl. 315—17 **13 Claims**

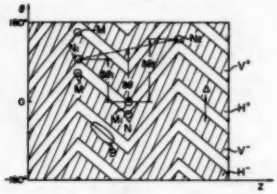
1. An image pickup tube comprising:

an electron gun disposed within the tube at one end thereof for producing an electron beam;

a target disposed within the tube at the other end thereof and scanned with said electron beam;

a focusing coil disposed around the tube for generating a magnetic field to focus said electron beam; and

a plurality of deflection electrodes disposed on the inner surface of the tube between said electron gun and said target for deflecting said electron beam, wherein each of said deflection electrodes is configured so that when developed to a plane a plurality of electrode portions each of a substantially linear form are arrayed in a zigzag pattern having upper apices and lower apices alternately, said



upper apices and said lower apices included in each of said deflecting electrodes are positioned on a helix revolving about the axis of said tube at a predetermined angle, one end (A) and the other end (B) of said helix form with the axis (O) of said tube a twist (<ABO) angle which is not greater than 105°, and an average value of angles (<MON_1 and <MON_2) formed respectively by each upper apex and two lower apices (N_1, N_2) located adjacent to said upper apex (M) with reference to the axis (O) of the tube is in a range of 116° to 127°.

4,701,669

COMPENSATED LIGHT SENSOR SYSTEM

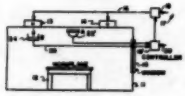
W. John Head, West Hill, and Francis M. Watson, Don Mills, both of Canada, assignors to Honeywell Inc., Minneapolis, Minn.

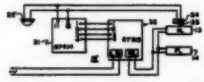
Filed Feb. 15, 1985, Ser. No. 702,179

Claims priority, application Canada, May 14, 1984, 454231

Int. Cl.[4] H05B *37/02, 37/04, 41/36*

U.S. Cl. 315—155 **6 Claims**





1. A system for controlling the level of light at a workplane within a building, said level of light being supplied from sources of light including sunlight and at least one artificial light source, said system compensating for variations in sunlight within the building to produce a substantially constant light level at said workplane, said system comprising:

first light sensor means for sensing light at a workplane area within the building;

second light sensor means for sensing only light from said artificial light source;

controller means connected to said first and second light sensor means and having an output such that the ratio of the light sensed by said first and second sensor means to the light at said workplane remains substantially constant as light from said sources varies; and,

means responsive to the output of said controller for controlling the level of said artificial light for maintaining a substantially constant level of light at said workplane.

4,701,670

OPTICAL WRITE DEVICE

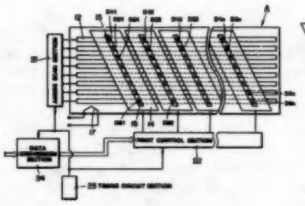
Hiroshi Watanabe, and Yukihiko Shimizu, both of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Aug. 26, 1986, Ser. No. 900,611

Claims priority, application Japan, Aug. 26, 1985, 60-186888; Oct. 22, 1985, 60-235886

Int. Cl.[4] G03G *15/00, 13/00;* **H01J** *1/62*

U.S. Cl. 315—169.3 **14 Claims**



1. An optical write device comprising:

a vacuum fluorescent tube section including a substrate, a plurality of stripe-like anode conductors arranged on said substrate and a plurality of control electrodes each formed with a slit extending in the longitudinal direction thereof and arranged obliquely across a direction of arrangement of said anode conductors, said anode conductors having phosphor layers deposited on portions thereof opposite to said slits of said control electrodes to form luminous dots;

an anode scan section for scanning a plurality of said anode conductors once at a predetermined cycle; and

a print control section for supplying a print signal to said control electrodes in synchronism with the scanning of said anode conductors.

4,701,671

HIGH-FREQUENCY OSCILLATOR-INVERTER BALLAST CIRCUIT FOR DISCHARGE LAMPS

Edward H. Stupp, Spring Valley; Mark W. Fellows, Monroe, and Walter G. Steneck, Ossining, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 725,887, Apr. 22, 1985, abandoned, which is a continuation of Ser. No. 382,734, May 27, 1982, Pat. No. 4,560,908. This application Aug. 6, 1986, Ser. No. 894,375

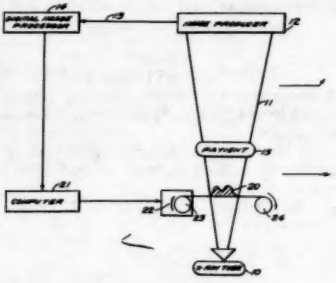
The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

Int. Cl.[4] H05G *37/02*

U.S. Cl. 315—224 **7 Claims**

1. A high frequency oscillator-inverter for starting and operating at least one electric discharge lamp from a low frequency AC power source comprising, a pair of input terminals for connection to the AC power source, a rectifier circuit having an input coupled to the input termianls and an output for supplying a fluctuating DC voltage, an oscillator-inverter circuit including at least one transistor, a ballast coupling

circuit for coupling the output voltage of the oscillator-inverter circuit to at least one said discharge lamp, said ballast circuit including a transformer having a primary winding coupled to said one transistor and a secondary winding coupled to said one discharge lamp, a capacitor coupled to the transformer primary winding to form a parallel resonant circuit for the oscillator-inverter circuit which exhibits a high oscillation operating frequency relative to said low frequency AC power source, means coupling the output of the rectifier



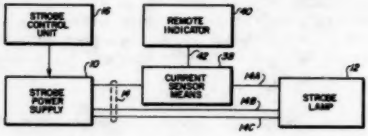
circuit to said oscillator-inverter circuit to product oscillation at said operating frequency, a regenerative power supply, means for switching said regenerative power supply into and out of circuit with the oscillator-inverter circuit as a function of a given voltage threshold level, means including the regenerative power supply and the switching means for periodically varying the oscillation frequency of the oscillator-inverter circuit in a sense that tends to maintain the lamp current constant in the operating condition of the lamp.

4,701,672

STROBE FLASH MONITOR

Scott T. Sikora, Mesa, Ariz., assignor to Tomar Electronics, Inc., Tempe, Ariz.

Filed May 28, 1985, Ser. No. 737,797
Int. Cl.[4] H05B *41/32*
U.S. Cl. 315—241 S **17 Claims**



1. Apparatus for electronically monitoring the emission of optical flashes by a strobe lamp from a remote location spaced apart from said strobe lamp comprising:

a. a strobe power supply for causing a strobe lamp to emit an optical flash by periodically discharging an energy storage capacitor through said strobe lamp to direct a capacitor discharge current pulse through said strobe lamp;

b. current sensor means coupled in series with the flow of the capacitor discharge current pulse through said strobe lamp for generating an output voltage corresponding to the flow of the capacitor discharge current pulse through said strobe lamp and to the emission of an optical flash by said strobe lamp; and

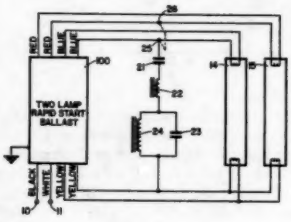
c. remote indicator means spaced apart from said strobe lamp and coupled to said current sensor means for generating a humanly perceptible output signal in response to the output voltage from said current sensor means to enable a strobe system user to continuously monitor the emission of optical flashes by said strobe lamp without visually observing said strobe lamp.

4,701,673

BALLAST ADAPTOR FOR IMPROVING OPERATION OF FLUORESCENT LAMPS

James L. Lagree, Wilkinsburg, and Robert T. Elms, Monroeville, both of Pa., assignors to North American Philips Lighting Corp., Somerset, N.J.

Continuation of Ser. No. 566,240, Dec. 28, 1983, Pat. No. 4,631,450. This application May 16, 1986, Ser. No. 864,169
The portion of the term of this patent subsequent to Dec. 23, 2003, has been disclaimed.
Int. Cl.[4] H05B *37/00, 39/00, 41/36*
U.S. Cl. 315—244 **13 Claims**



1. A ballast system for operation of one or more discharge lamps of a first type comprising: a ballast device having a pair of input terminals for connection to a source of AC supply voltage and at least first and second output terminals for connection to one or more discharge lamps, said ballast device having been designed for use with one or more discharge lamps of a second type similar to the first type of lamp but having significantly different starting and operating characteristics, and a shunt harmonic current source network connected to said first and second output terminals of the ballast device so that the shunt harmonic current source network will be in parallel with a discharge lamp of the first type when said lamp is connected to the ballast device output terminals, and wherein the shunt harmonic current source network includes passive circuit elements chosen so that at least one odd order higher harmonic current will be supplied by the shunt harmonic current source to said lamp in the operating condition of the lamp.

4,701,674

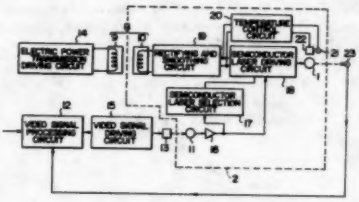
OPTICAL BEAM MODULATION AND DEFLECTION DEVICE

Hiroshi Oono, and Shigenori Oosaka, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 213,595, Dec. 5, 1980, abandoned. This application Mar. 23, 1987, Ser. No. 29,356
Claims priority, application Japan, Dec. 10, 1979, 54-160046
Int. Cl.[4] H01J *7/44;* G06K *7/10*
U.S. Cl. 315—276 **10 Claims**

1. An optical beam modulation and deflection device comprising a rotator rotatably supported on a base to rotate about a rotational axis, a light source mounted on said rotator to be directed outwardly of said rotator, and a condenser optical system mounted on said rotator to rotate therewith, said condenser optical system being mounted on the rotator in a manner such that the orientation of said condenser optical system relative to said light source remains fixed during rotation, said condenser optical system focusing the light emitted from the source outwardly of said rotator, a rotating transformer the primary side of which is fixed on said base and the secondary side of which is fixed on said rotator for supplying electric power for driving said light source in a contactless manner

through said rotating transformer, and a light beam scanning device for recording or reading out an image by scanning a



medium placed near said rotator with a light beam from said light source.

4,701,675

APPARATUS FOR LIMITING ARC DISCHARGE CURRENT IN INCANDESCENT LAMP

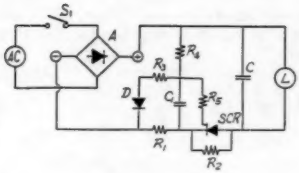
Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Dec. 5, 1985, Ser. No. 805,288

Claims priority, application Japan, Dec. 10, 1984, 59-259351

Int. Cl.[4] G05F *1/00;* **H05B** *37/02, 39/04, 41/36*

U.S. Cl. 315—310 **4 Claims**



1. A device to limit arc discharges arising in a dc-operated incandescent lamp, comprising

a rectifier circuit having input terminals connected with an ac source, and output terminals connected with said incandescent lamp,

first resistance means connected in series with the incandescent lamp, for limiting both an initial switch-on surge into the incandescent lamp and an arc discharge current due to the filament of the incandescent lamp being snapped,

second resistive means connected in series with the incandescent lamp, for providing by virtue of a voltage drop across it a signal indicating occurrence of arc discharge current,

switching means having a trigger electrode and a main current path, said main current path being connected in parallel with the first resistive means, and

a time constant circuit, having an output connected with the trigger electrode of the switching means, to retard, on switch-on, the conduction of the switching means in accordance with its time constant, and to suspend the conduction of the switching means when the voltage across the second resistive means reaches a predetermined level.

4,701,676

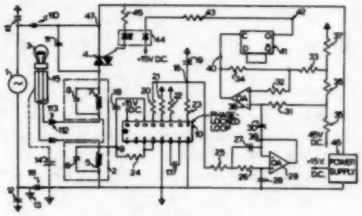
TOUCH CONTROL ADAPTOR

John A. Gibson, 101 Kersey Crescent, Richmond Hill, Ontario, L4C 5X4, Canada

Continuation-in-part of Ser. No. 810,217, Dec. 18, 1985, abandoned. This application Dec. 15, 1986, Ser. No. 941,988

Int. Cl.[4] H01H *35/00;* **H05B** *37/02*

U.S. Cl. 315—362 **13 Claims**



1. A device for connecting in series between a source of electrical power and only an appliance's power connection which regulates the supply of electrical power to the appliance in response to a mere touch of the appliance, said device comprising;

(a) an electrical connector for interposing the device between the current-carrying components of the appliance and the power supply;

(b) an electric power regulator for increasing or decreasing the electric power provided to said appliance;

(c) an electrical impedance network for electrically including the appliance within the impedance network when the device is connected between the source of electrical power and the appliance which impedance network has a very low impedance to power supply frequencies and a high impedance to frequencies higher than power supply frequencies;

(d) an electronic sensing circuit for sensing the distributed capacitance to ground characteristic of the appliance as an electrical signal;

(e) an electronic signal processing network to condition the said electrical signal; and

(f) a memory and control circuit network to convert changes in said electrical signal into control signals for said electric power regulator.

4,701,677

COLOR CATHODE RAY TUBE APPARATUS

Shigeya Ashizaki, Takatsuki; Koichi Sugahara, Sakai; Hideo Muranishi, Osaka, and Masao Natsuhara, Otsu, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Jul. 29, 1985, Ser. No. 760,247

Claims priority, application Japan, Jul. 30, 1984, 59-159665; Jul. 30, 1984, 59-159666; Aug. 2, 1984, 59-163312; Aug. 10, 1984, 59-168094

Int. Cl.[4] H01J *29/58*

U.S. Cl. 315—382 **10 Claims**

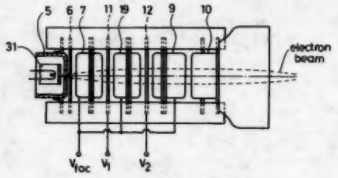
1. A color cathode ray tube apparatus which uses three electron beams, comprising:

a first focusing grid to which a first focusing voltage is to be applied;

a second focusing grid to which a second focusing voltage is to be applied;

means for generating a quadrupole electric field between said first focusing grid and said second focusing grid, said generating means including at least one horizontal-electric-field boosting grid connected with said first focusing grid for said three electron beams and at least one vertical-

electric-field boosting grid connected with said second focusing grid for said three electron beams;



wherein at least one of said horizontal-electric-field boosting grid and said vertical-electric-field boosting grid are applied with a focusing voltage which varies responding to the change in the deflection angle of the electron beams.

4,701,678

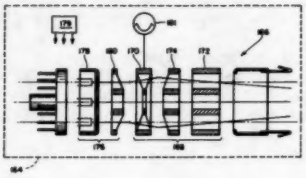
ELECTRON GUN SYSTEM WITH DYNAMIC FOCUS AND DYNAMIC CONVERGENCE

Allen P. Blacker, Hoffman Estates, and Wayne R. Chiodi, Northbrook, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 808,137, Dec. 11, 1985, abandoned. This application Oct. 20, 1986, Ser. No. 921,168

Int. Cl.[4] H01J *29/58*

U.S. Cl. 315—382 **16 Claims**



1. An electron gun system for a color cathode ray tube comprising:

means including cathode means for developing an electron beam;

main focus lens means for receiving said electron beam and forming a focused electron beam spot at the screen of the tube, said main focus lens means having a plurality of electrodes situated on a common axis;

means for developing and applying to said electrodes potentials effective to form one or more focusing field components between said electrodes;

said lens means being so structured and arranged as to cause to be formed between adjacent electrodes at least one focusing field component effective to significantly divert a passed beam from a straight-line path through a predetermined angle; and

means for developing and applying a varying voltage to at least one of said electrodes to cause the strength of said asymmetric field component, and thus said angle by which said beam is diverted, to vary in response to said varying voltage.

4,701,679

METHOD OF AND APPARATUS FOR CONTROLLING AMOUNT OF ELECTRON BEAM IN IMAGE PICKUP TUBE

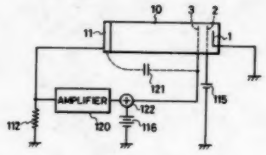
Kazuhiro Satou; Koji Kudo; Masanori Maruyama; Itaru Mimura, and Shusaku Nagahara, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1986, Ser. No. 893,827

Claims priority, application Japan, Aug. 23, 1985, 60-183950; Oct. 21, 1985, 60-233406; Feb. 10, 1986, 60-25855

Int. Cl.[4] G01S *3/16, 3/28, 1/00*

U.S. Cl. 315—383 **18 Claims**



1. A method for controlling the amount of an electron beam of an image pickup tube including a cathode, a first grid electrode disposed as a next stage of said cathode and provided with an aperture, a second grid electrode disposed as a next stage of said first grid electrode and provided with an aperture, and a photoconductive target, comprising the steps of:

operating said first grid electrode with a voltage positive with respect to said cathode; and

applying a signal voltage corresponding to a signal current obtained from said photoconductive target to said second grid electrode with a polarity opposite to a polarity of a signal charge generated on said photoconductive target.

4,701,680

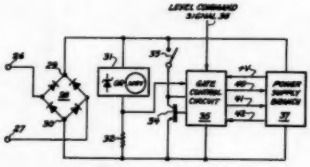
WALL BOX FLUORESCENT LAMP DIMMER

Robert P. Alley, Clifton Park, and William H. Bicknell, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,142

Int. Cl.[4] H05B *41/16*

U.S. Cl. 315—287 **16 Claims**



1. A dimming circuit for connecting in series with a fluorescent lighting system, said lighting system including a nondimming ballast for supplying power to a fluorescent lamp, said dimming circuit comprising;

a full-wave diode rectifier have input and output terminals, one of the input terminals of said rectifier adapted to be connected to a source of AC power and the other input terminal of said rectifier adapted to be coupled to one terminal of said ballast;

a switch branch coupled between the output terminals of said rectifier including an on-off switch connected in series with a controllable semiconductor switching device;

an overvoltage dissipating branch including a voltage sensitive device exhibiting a dynamic resistance connected to one output terminal of said rectifier and including a resis-

tor connected to the other output terminal of said rectifier, said voltage sensitive device and said resistor being connected in series; and

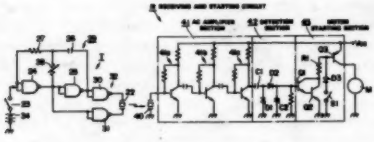
a gate control circuit coupled to said resistor and said controllable semiconductor switching device, said gate control circuit including zero crossing detection means for detecting zero crossings of the current supplied to said ballast by said AC power source, said gate control circuit providing a gate signal for rapidly switching said controllable semiconductor switching device on and off during a notch period within each half-cycle of current supplied by said AC power source, the beginning and ending of said notch period being determined by said gate control circuit in response to a level command, said gate signal turning said controllable semiconductor switching device on during the portions of each half-cycle outside said notch period to establish a low frequency, variable duty cycle current which results in a controllable light output from said lamp.

4,701,681

STARTING DEVICE FOR A TOY MOTOR USING AN ULTRASONIC WAVE SIGNAL

Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Jun. 17, 1986, Ser. No. 875,199
Claims priority, application Japan, Jun. 28, 1985, 60-99792
Int. Cl.[4] A63H *30/02*
U.S. Cl. 318—16 **2 Claims**



1. A starting device for a toy motor using an ultrasonic wave signal comprising:

a transmitter for generating an ultrasonic wave signal; and

a receiving and starting circuit for receiving the ultrasonic wave signal from said transmitter and for starting said toy motor, said receiving and starting circuit including:

a receiving transducer for receiving said ultrasonic wave signal;

an amplifier section connected to said receiving transducer for amplifying the received signal including R-C amplifier circuits;

a detection section connected to the output of said amplifier section for generating a detected output signal including diode rectifiers and charging-discharging capacitor; and

a motor starting section connected to said detection section for energizing said motor in response to an output signal from said detection section.

4,701,682

CONTROL SYSTEM FOR MAINTAINING TRACTION OF ROLLING STOCK

Tetsuji Hirotsu; Hisakatsu Kiwaki; Kiyoshi Nakamura; Hiroshi Narita; Syozi Kasai; Akira Kimura, and Yoshio Tsutsui, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 820,327
Claims priority, application Japan, Jan. 21, 1985, 60-7538
Int. Cl.[4] B61C *15/08*
U.S. Cl. 318—52 **8 Claims**

1. A method of controlling an electronic driving motor for driving a vehicle by controlling the force between a drive wheel and a rail on which the vehicle travels comprising the steps of:

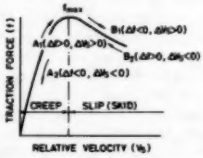
(a) monitoring the relative velocity of the periphery of said drive wheel with respect to the velocity of said vehicle and generating a first signal representative of said relative velocity;

(b) generating a second signal representative of the rate of change of said relative velocity as represented by said first signal;

(c) monitoring the rate of change of force acting between said driving wheel and said rail and generating a third signal representative thereof;

(d) in response to the polarity of the rate of change of relative velocity as represented by said second signal differing from the polarity of the rate of change of force acting between said driving wheel and said rail as represented by said third signal, generating a fourth signal for decreasing the force between said driving wheel and said rail.

5. A method of controlling an electric driving motor in a vehicle for driving rolling stock having first means for controlling the force acting between a wheel and a rail in accordance



with a current reference signal generated on the basis of an instruction, second means for detecting the difference between a peripheral velocity of the wheel and vehicle velocity, third means for discriminating an unallowable nonadhesive state of running of the wheel when the velocity difference detected by the second means exceeds a certain value to generate a compensating signal for decreasing the value of the current reference signal applied to the first means so that the force acting between the wheel and the rail is reduced; wherein the compensating signal is obtained by the following steps:

calculating the rate of change of the velocity difference with respect to time;

calculating the rate of change of the force acting between the wheel and the rail with respect to time; and

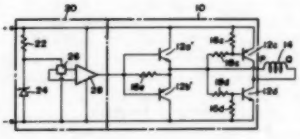
generating said compensating signal for decreasing the current reference when the polarity of the rate of change of the relative velocity is different from that of the rate of change of the force acting between the wheel and the rail.

4,701,683

INVERTER CIRCUIT FOR CONVERTING DC POWER TO PULSE WAVE POWER

Yoshiro Kikkawa, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 723,616, Apr. 15, 1985, abandoned. This application Aug. 5, 1986, Ser. No. 892,476
Claims priority, application Japan, May 18, 1984, 59-100849; May 18, 1984, 59-73316[U]; Jun. 29, 1984, 59-99029
Int. Cl.[4] H02K *29/08*
U.S. Cl. 318—254 **6 Claims**



1. An inverter circuit for controlling a brushless electric motor which has a permanent magnet rotor, a single stator coil and a position sensor for detecting a rotational position of said

rotor and for providing an electrical output which is either High or Low, and having two PNP transistors and two NPN transistors for supplying an electric current to said electric motor, wherein said inverter circuit comprises:

a first transistor of an NPN type, having a collector connected to a positive terminal of a DC power source and having a base connected to said position sensor;

a second transistor of a PNP type, having a collector connected to a negative terminal of said DC power source and having a base connected to said position sensor;

wherein said first transistor has an emitter connected to an emitter of said second transistor so as to provide a first connection;

a resistor connected between said position sensor and said first connection;

a third transistor of said PNP type, having an emitter connected to said positive terminal of said DC power source and having a base bias resistor connected between a base thereof and said first connection;

a fourth transistor of said NPN type, having an emitter connected to said negative terminal of said DC power source and having a base bias resistor connected between a base thereof and said first connection;

wherein said third transistor has a collector connected to a collector of said fourth transistor so as to provide a second connection; said stator coil being connected between said first connection and said second connection,

wherein said first through fourth transistors are a first state when said output of said position sensor is Low, and are in a second state when said output of said position sensor is High; said second and third transistors being in an ON state and said first and fourth transistors being in an OFF state when said first through fourth transistors are in said first state; and said first and fourth transistors being in an ON state and said second and third transistors being in an OFF state when said first through fourth transistors are in said second state such that said ON/OFF states of said first through fourth transistors are changed from said first state to said second state, or from said second state to said first state in accordance with said output of said position sensor, whereby electric current supplied to said stator coil is alternately supplied from said first connection to said second connection and from said second connection to said first connection in dependance upon said ON/OFF states of said first through fourth transistors.

5. An inverter circuit for controlling a brushless electric motor which has a permanent magnet rotor, a single stator coil and a position sensor for detecting a rotational position of said rotor and for providing an electrical output which is either High or Low, and having two PNP transistors and two NPN transistors for supplying an electric current to said electric motor, wherein said inverter circuit comprises:

a first transistor of a PNP type, having an emitter connected to a positive terminal of a DC power source, and having a base bias resistor connected between a base thereof and said position sensor;

a second transistor of an NPN type, having an emitter connected to a negative terminal of said DC power source and having a base bias resistor connected between a base thereof and said position sensor;

wherein said first transistor has a collector connected to a collector of said second transistor so as to provide a first connection;

a third transistor of said PNP type, having an emitter connected to said positive terminal of said DC power source and having a base bias resistor connected between a base thereof and said first connection;

a fourth transistor of said NPN type, having an emitter connected to said negative terminal of said DC power source and having a base bias resistor connected between a base thereof and said first connection;

wherein said third transistor has a collector connected to a collector of said fourth transistor so as to provide a second connection; said stator coil being connected between said first connection and said second connection;

and wherein said first through fourth transistors are in a first state when said output of said position sensor is Low, and are in a second state when said output of said position sensor is High; said first and fourth transistors being in an ON state and said second and third transistors being in an OFF state when said first through fourth transistors are in said first state; and said first and fourth transistors being in an OFF state and said second and third transistors being in an ON state when said first through fourth transistors are in said second state such that said ON/OFF states of said first through fourth transistors are changed from said first state to said second state, or from said second state to said first state in accordance with said output of said position sensor, whereby electric current supplied to said stator coil is alternately supplied from said first connection to said second connection and from said second connection to said first connection in dependence upon said ON/OFF states of said first through fourth transistors;

said inverter circuit further comprises a current controller means, wherein said current controller means has a power transistor, connected in series to a principle circuit portion of said apparatus, for controlling an electric current so that a limited amount of electric power is supplied to said stator coil when an excessive current is detected.

6. An inverter circuit for controlling a brushless electric motor which has a permanent magnet rotor, a single stator coil and a position sensor for detecting a rotational position of said rotor and for providing an electrical output which is either High or Low, and having two PNP transistors and two NPN transistors for supplying an electric current to said electric motor, wherein said inverter circuit comprises:

a first transistor of a PNP type, having an emitter connected to a positive terminal of a DC power source, and having a base bias resistor connected between a base thereof and said position sensor;

a second transistor of an NPN type, having an emitter connected to a negative terminal of said DC power source and having a base bias resistor connected between a base thereof and said position sensor;

wherein said first transistor has a collector connected to a collector of said second transistor so as to provide a first connection;

a third transistor of said PNP type, having an emitter connected to said positive terminal of said DC power source and having a base bias resistor connected between a base thereof and said first connection;

a fourth transistor of said NPN type, having an emitter connected to said negative terminal of said DC power source and having a base bias resistor connected between a base thereof and said first connection;

wherein said third transistor has a collector connected to a collector of said fourth transistor so as to provide a second connection; said stator coil being connected between said first connection and said second connection;

and wherein said first through fourth transistors are in a first state when said output of said position sensor is Low, and are in a second state when said output of said position sensor is High; said first and fourth transistors being in an ON state and said second and third transistors being in an OFF state when said first through fourth transistors are in said first state; and said first and fourth transistors being in an OFF state and said second and third transistors being in an ON state when said first through fourth transistors are in said second state such that said ON/OFF states of said first through fourth transistors are changed from said first state to said second state, or from said second state to said first state in accordance with said output of said position sensor, whereby electric current supplied to said stator coil is alternately supplied from said first connection to said second connection and from said second connection to said first connection in dependence upon said ON/OFF states of said first through fourth transistors;

further comprising between said position sensor and said bases of said first and second transistors:

a first driving transistor of said PNP type, having an emitter connected to said positive terminal of said DC power source and having a base connected through a resistor to said position sensor, and having a collector connected to one end of a driving resistor;

a second driving transistors of said NPN type, having an emitter connected to said negative terminal of said DC power source and having a base connected through a resistor to said position sensor, and having a collector connected to another end of said driving resistor;

wherein one end of said driving resistor is connected through said base bias resistor of said first transistor to said base of said first transistor, and another end of said driving resistor is connected through said base bias resistor of said second transistors to said base of said second transistor; and wherein said ON/OFF state of each of said first through fourth transistors is controlled by a single switching signal which is supplied to said bases of said first and second driving transistors, thereby causing electric power to be supplied to said stator coil.

4,701,684

DOOR OR GATE OBSTRUCTION CONTROL

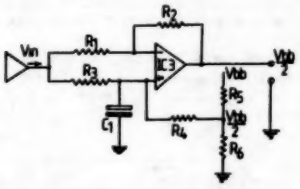
Raymond L. Seidel, Croydon, and Marian Viola, Redwood Park, both of Australia, assignors to Automatic Roller Doors Australia Pty. Ltd., Australia

Filed Nov. 26, 1985, Ser. No. 801,956

Claims priority, application Australia, Nov. 26, 1984, PG8291; Sep. 11, 1985, PH2382

Int. Cl.[4] H02P *1/22*; G05D *3/10*

U.S. Cl. 318—282 **11 Claims**



1. An obstruction control arrangement for a door or gate opening/closing mechanism having an electric operating motor, said control arrangement comprising motor sensor means adapted to sense an operating characteristic of said motor, a first comparator means having two inputs and a signal relating to said operating characteristic being applied to both said inputs,

circuit means connected with one of said two inputs and arranged to cause a time delay between said two inputs, said first comparator means having an output representing the difference between the signal at said two inputs, and

activating means arranged to stop or reverse said electric motor in response to the output of said first comparator means exceeding a preset level, being indicative of said door or gate being obstructed in its normal course of travel.

4,701,685

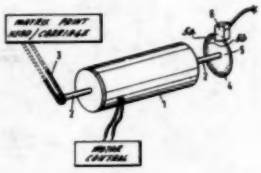
CONTROLLING A D.C. MOTOR

Manfred Grüner, Ulm, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 387,254

Int. Cl.[4] G05B *5/00*

U.S. Cl. 318—309 **7 Claims**



1. An apparatus for controlling the speed of a D.C. motor, comprising:

metering means for providing a pulse train representative of the actual speed of the motor;

first means, including a first, fixed-rate clock pulse counter for ascertaining whether or not the respective pulses of the train occur before or after a particular count number as counted by the first pulse counter has been reached;

second means connected to the metering means for turning the motor current off in response to each of the pulses of the train;

a second counter connected to be responsive to the ascertaining by the first means and further responsive to the pulses of the train for being decremented or incremented accordingly; and

third means connected to the second counter for metering a current pause length being an interwall between the turning off of the motor current by operation of the second means and a subsequent turning on of the motor current, the third means providing for turning the motor current on again accordingly in termination of the pause and in dependence upon the state of the second counter.

4,701,686

LINE TRACKING CONTROL METHOD

Hajimu Kishi; Shinsuke Sakakibara, and Takayuki Ito, all of Hino, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP85/00455, § 371 Date Apr. 24, 1986, § 102(e) Date Apr. 24, 1986, PCT Pub. No. WO86/01450, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 16, 1985, Ser. No. 860,198

Claims priority, application Japan, Aug. 24, 1984, 59-175155

Int. Cl.[4] G05D *23/275*

U.S. Cl. 318—632 **4 Claims**

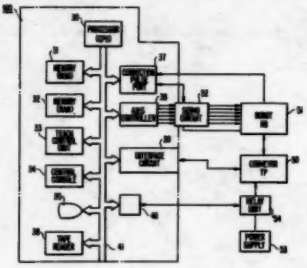
1. A line tracking control method of controlling a robot with a control device to match a speed of movement of a conveying device, the line tracking control method comprising:

(a) determining a single time the speed of movement of the conveying device as a constant and storing the constant;

(b) determining a single time a corrective value and setting a boundary value for the speed of movement of the conveying device based on the speed of movement of the conveying device determined in step (a); and

(c) comparing the boundary value determined in step (b)

with an actual speed of movement of the conveying device and adding or subtracting said corrective value based



on the result of comparison, thus determining a command value for the robot.

4,701,687

CONTROLLER FOR ENERGIZATION OF A STEPPER MOTOR

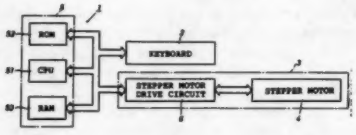
Satoshi Yoshimoto, Komaki, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 23, 1986, Ser. No. 888,441

Claims priority, application Japan, Jul. 30, 1985, 60-169004; Sep. 12, 1985, 60-202225

Int. Cl.⁴ H02S *8/00*

U.S. Cl. 318—696 **10 Claims**



1. An N phase/N+1 phase energization type controller for alternately energizing an N number of phases and an N+1 number of phases of a stepper motor having a rotor and a stator, N being an integer equal to or larger than 1, said controller comprising:

output means for providing a determination pulse having a preset time period during which said rotor is in a pause position;

memory means responsive to said output means for detecting and storing a signal indicative of the energization phase condition existing at the time of said determination pulse;

control means responsive to said memory means for controlling a time period of a first pulse for N phase energization so as to be shorter than a time period of a second pulse for N+1 phase energization if said stepper motor starts on said first pulse.

4,701,688

SAFETY BOOSTER CABLES WITH TIME DELAY

Raul Guim, 834 Venetia, Coral Gables, Fla. 33134

Continuation-in-part of Ser. No. 609,030, May 10, 1984, Pat. No. 4,607,209. This application Mar. 4, 1986, Ser. No. 836,069

Int. Cl.⁴ H02J *7/00*

U.S. Cl. 320—25 **10 Claims**

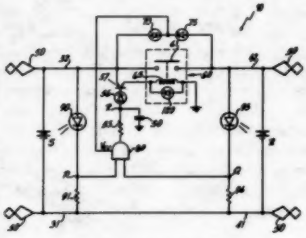
1. A safety booster cable assembly for transmitting electricity from a D.C. source, having electrodes, to a receiving battery, having electrodes, comprising:

A. first conductor means having two ends connecting one of the electrodes of said D.C. source to an electrode in said receiving battery;

B. second conductor means having two ends connecting the other electrodes of said source and battery;

C. gate means for comparing the voltage polarity of the electrodes connected to the ends of said first cable means and having two inputs and one output and so arranged and constructed to provide an output signal if the polarities are the same and another output signal if they are different;

D. relay means for interrupting the connection between the



electrodes connected by said first conductor means and said relay means having a contact that electrically connects the electrodes connected by said first conductor means, and a coil input that is connected to the output of said gate means so that said relay means interrupts said connection with one of said output signals and maintains the connection with the other output signal; and

E. time delay means connected to the output of said gate means so that the transmission of the output of said gate means to said relay means is delayed by a predetermined time period.

4,701,689

OPTIMAL CONTROL POWER SYSTEM STABILIZER AND METHOD USING SIMULATING STATE VARIABLES

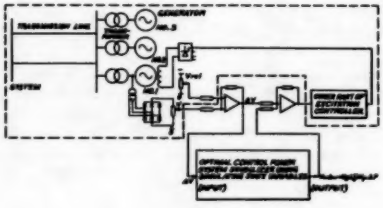
Ren Yuan; Chen Xianzhi, both of Wuchang; Feng Yuanxi, Yichang; Li Guojiu, Wuchang; Huang Dake, Yichang; Zhang Yongli, Wuchang, and Sun Quanzhong, Yichang, all of China, assignors to Huazhong Institute of Technology, Wuchang, China

Filed Apr. 4, 1986, Ser. No. 848,715

Claims priority, application China, Apr. 18, 1985, 85103037

Int. Cl.⁴ H02P *9/14*

U.S. Cl. 322—19 **11 Claims**



1. An optimal control power system stabilizer using simulating state variables for installation in fast excitation control circuits to dampen low frequency oscillations comprising:

a band-pass filter transferring the voltage deviation into the angular frequency deviation;

at least one of an integrator transferring angular frequency deviation into a power angle deviation and a differentiator

for transferring angular frequency deviation into power deviation; and

adder means for summing the angular frequency deviation and at least one of the other deviations.

11. A control method utilized in fast excitation control circuits to dampen the low frequency oscillations including the steps of:

measuring a voltage and obtaining a voltage deviation;

converting said voltage deviation into an angular frequency deviation with a band-pass filter; and

controlling generator excitation with the angular frequency deviation and voltage deviation.

4,701,690

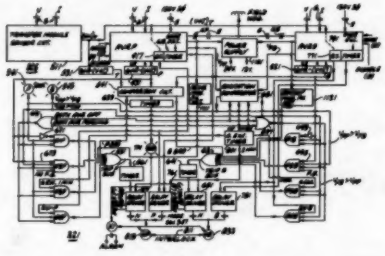
TRANSFER APPARATUS, REGULATING APPARATUS AND METHODS

Manuel Fernandez, University City, Mo., and Waldo J. Frierdich, Highland, Ill., assignors to Basler Electric Company, Highland, Ill.

Continuation-in-part of Ser. No. 802,712, Nov. 27, 1985. This application Mar. 6, 1986, Ser. No. 836,833

Int. Cl.[4] H02P *9/00*

U.S. Cl. 322—28 **38 Claims**



1. Transfer apparatus for use with an AC generator having a field winding, the DC energization of which controls the output of the generator, and associated first and second voltage regulators each including means for sensing the output of the generator and means for varying the DC energization of the generator field winding to regulate the output of the generator to a respective reference level, the transfer apparatus comprising:

means for generating a first signal as a function of the generator output as sensed by the first voltage regulator sensing means and a second signal as a function of the generator output as sensed by the second voltage regulator sensing means;

means for independently producing an additional signal to which the first and second signals ordinarily have a predetermined relationship; and

means for selecting the first or second voltage regulator to energize the generator field winding, the selection depending on whether or not there is a departure of the first signal from the predetermined relationship to the additional signal when the second signal maintains its predetermined relationship thereto.

4,701,691

SYNCHRONOUS GENERATORS

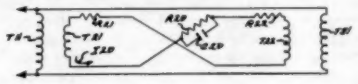
Leo G. Nickoladze, 1155 Kahili St., Kailua, Hi. 96734

Continuation-in-part of Ser. No. 733,900, May 14, 1985, abandoned. This application Jun. 20, 1986, Ser. No. 876,481

Int. Cl.[4] H02P *9/42, 9/48*

U.S. Cl. 322—32 **15 Claims**

1. In a line synchronized generator assembly comprising a first and second, substantially coaxial, annular stator each provided with wound poles connected to said line and a first and second inductive rotor each provided with a corresponding winding and mounted on a common rotary shaft received respectively in the interior of said first and second stator, said first and second rotors having said winding thereof interconnected in inverted connection, the improvement comprising:



an impedance assembly inserted between said first and second rotor each said impedance assembly including a resistor connected in parallel with a capacitor for providing impedance in the inverted connections thereof.

4,701,692

RECTIFYING SYSTEM FOR MAGNET-TYPE AC GENERATOR

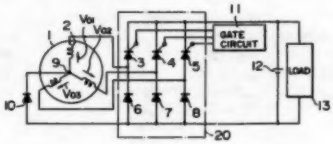
Hirotaka Takeuchi, Tokoname; Jiro Asai, Kariya; Yasuhumi Yamada, and Sumio Yanase, both of Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 12, 1986, Ser. No. 828,741

Claims priority, application Japan, Feb. 15, 1985, 60-28925; Jul. 8, 1985, 60-149656

Int. Cl.[4] H02J *7/24*

U.S. Cl. 322—90 **4 Claims**



1. A rectifying system for a magnet-type AC generator which feeds a battery and which has an armature winding of multiple phases having a neutral point, comprising:

rectifier means, including a composite bridge having a plurality of thyristors and a plurality of diodes, for regulating and rectifying an output voltage of the AC generator, said plurality of diodes being connected to one electrode of the battery and said plurality of thyristors being connected to an other electrode of said battery in common;

a neutral-point diode inserted only between said neutral point of said armature winding and said one electrode of said battery connected with the plurality of diodes in common, the output of said neutral point being rectified through said neutral-point diode, said output voltage of said neutral point being regulated by said plurality of thyristors, said output voltage of the neutral point being applied to said battery through said neutral-point diode, whereby a current flowing at the neutral point of said armature flows to the battery only through said neutral-point diode.

4,701,693

SOLAR BATTERY CIRCUIT

Toshio Nishimura, Jyoyo, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 17, 1986, Ser. No. 839,993

Claims priority, application Japan, Mar. 19, 1985, 60-56355

Int. Cl.[4] H02J *9/04*

U.S. Cl. 323—303 **2 Claims**

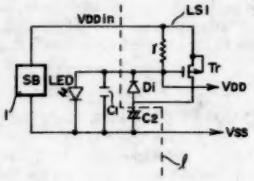
1. A solar power supply circuit comprising:

solar battery means for generating a power voltage in response to incident light;

power supply means for generating a constant supply voltage at an output terminal in response to said power voltage, when said power voltage is above a first predetermined level;

first condenser means connected across said power supply means for backing up said constant supply voltage in response to a temporary absence of said incident light;

second condenser means for storing supplemental back up power for said power supply circuit, said second condenser means providing said supplemental back up power



to said output terminal in response to a temporary absence of said incident light, for a period longer than that of said first condenser means; and

switching means, connected to said polar battery means, for charging said second condenser means when said power voltage is above a second predetermined level;

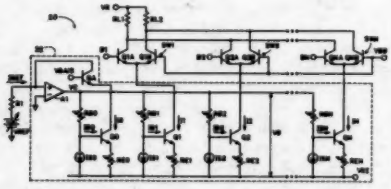
said switching means including MOS transistor means having source and drain terminals connected between said solar battery means and said second condenser means, resistor means connecting a gate terminal of said MOS means to said solar battery means, said gate terminal also being connected to said output terminal.

4,701,694

DIGITALLY SELECTABLE, MULTIPLE CURRENT SOURCE PROPORTIONAL TO A REFERENCE CURRENT

Bruce J. Penney, Portland, and Stewart S. Taylor, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 8, 1986, Ser. No. 904,595
Int. Cl.[4] G05F *3/22*
U.S. Cl. 323—317 **16 Claims**



1. An apparatus for producing an output signal of magnitude proportional to a reference signal comprising:

first and second transistors, each having a control terminal and first and second load terminals, said reference signal being operatively coupled to the first load terminal of said first transistor and the second load terminal of each said transistor being connected so as to provide a first current source for each said transistor, respectively;

means responsive to said reference signal for generating a control voltage coupled to the control terminal of said first transistor; and

means for offsetting said control voltage by an adjustable offset amount to produce an offset control voltage, said offset control voltage being applied to the control terminal of said second transistor such that said output signal is produced by said first load terminal of said second transistor, and said offset amount being adjusted so that potential difference between the control voltage and the second load terminals of said first and second transistors are substantially equal,

wherein said means for offsetting said control voltage comprises:

a second current source; and

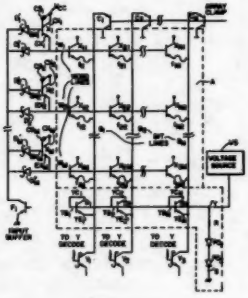
an adjustable resistor, the control terminal of said second transistor being coupled to said control voltage through said adjustable resistor and being coupled to said second current source.

4,701,695

SHORT DETECTOR FOR PROMS

Albert Chan; Mark Fitzpatrick, both of San Jose; Don Goddard, Cupertino; Robert J. Bosnyak, Los Gatos, and Cyrus Tsui, San Jose, all of Calif., assignors to Monolithic Memories, Inc., Santa Clara, Calif.

Division of Ser. No. 564,642, Dec. 22, 1983, Pat. No. 4,595,875. This application Feb. 14, 1986, Ser. No. 829,260
Int. Cl.[4] G01R *31/02*; G06F *11/00*
U.S. Cl. 324—510 **8 Claims**



1. A semiconductor device comprising:

a programmable cell including a programmable element and a bipolar transistor coupled to said programmable element, said bipolar transistor having first and second current-carrying leads and a control lead, said first current-carrying lead being coupled to said programmable element; and

means for applying a test voltage to said first current-carrying lead of said bipolar transistor relative to said control lead of said bipolar transistor to thereby reverse-bias the junction between said first current carrying lead and said control lead and, and for determining whether current through said first current-carrying lead indicates the presence of shorts or leakages so as to render said semiconductor device unacceptable.

4,701,696

RETARGETABLE BUFFER PROBE

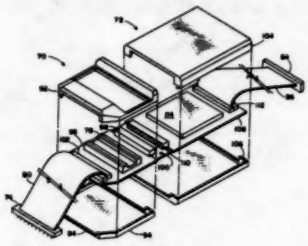
David W. Bogardus, Beaverton; Robin L. Teitzel, and David D. Chapman, both of Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 25, 1985, Ser. No. 801,450
Int. Cl.[4] G01R *31/28, 31/02*
U.S. Cl. 324—73 R **8 Claims**

1. A probe for accessing signals appearing on a set of external connection pins of an operating integrated circuit and for buffering said signals for external transmission, said probe comprising:

a replacement plug assembly, configured for accessing said

pins by having a plug adapted for insertion into a mounting socket in which said integrated circuit normally is inserted when operating, and having a test socket adapted for holding said integrated circuit by said pin set, said test socket and said plug being interconnected such that when said integrated circuit is held by said test socket, and said plug is inserted into said mounting socket, said integrated circuit operates as if it were inserted in said mounting socket;



a buffer probe assembly having signal buffering means, said replacement plug assembly and said buffer probe assembly being mounted in physically separable enclosures; and

means for selectively connecting the replacement plug assembly to the buffer probe assembly so that signals appearing on said integrated circuit pins are reordered by the replacement plug assembly and buffered by said buffering means for external transmission in a format independent of the type of integrated circuit.

4,701,697

ARRANGEMENT FOR MEASURING POTENTIAL DIFFERENCES

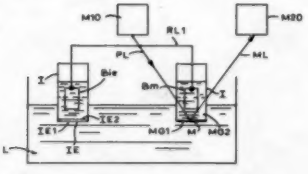
Dietrich W. Lübbers, Dortmund, and Norbert Opitz, Schwerte, both of Fed. Rep. of Germany, assignors to Max Planck Gesellschaft, Goettingen, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,927

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1983, 3301939

Int. Cl.[4] G01N *27/00*

U.S. Cl. 324—96 **63 Claims**



1. An arrangement for measuring potential differences in second-class conductors, comprising a potential generating body of a meterial which generates an electric potential on its interface with a second-class conductor; a potential measuring body of an electrically insulating and chemically inert material including optical indicators whose optical properties change in response to an applied electrical potential, said potential measuring body defining two opposite surfaces; said potential generating body and one of the two surfaces of said potential measuring body interfacing a measured second-class conductor; electrically conducting means for connecting the other surface of said potential measuring body with a potential generated on the interface of said potential generating body with the second-class conductor; and a light measuring device optically coupled to said optical indicators in said potential measuring body to measure a change of optical properties of said indicators and hence the electric potential applied to said other surface.

4,701,698

MICROPROCESSOR BASED ENERGY CONSUMPTION METER

Björn Karlsson, Fyrkloversegatan 125, Nödinge, Sweden (440 45), and Ingvar Jönsson, Slåttervallsgatan 9, Mölndal, Sweden (431 40)

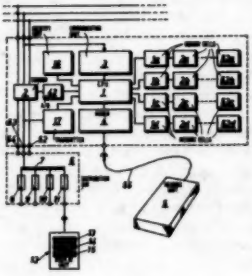
PCT No. PCT/SE81/00163, § 371 Date Jan. 26, 1982, § 102(e) Date Jan. 26, 1982, PCT Pub. No. WO81/03541, PCT Pub. Date Dec. 10, 1981

Continuation of Ser. No. 684,173, Dec. 21, 1984, abandoned, which is a continuation of Ser. No. 348,052, Jan. 26, 1982, abandoned. This PCT application Jun. 4, 1981, Ser. No. 914,519

Claims priority, application Sweden, Jun. 6, 1980, 8004239

Int. Cl.[4] G01R *15/08, 11/64;* G06F *15/20*

U.S. Cl. 324—116 **16 Claims**



1. An electricity meter for measuring, registering and reading a consumer's electrical energy consumption via an energy distribution in which the cost per unit energy of consumption differs from time to time, comprising:

a sensor providing an output signal representative of the electrical energy supplied to a consumer;

a time signal generating means;

a plurality of memory cells;

a central processing unit for calculating the power and/or energy supplied to the consumer from said output signal and storing the calculated values in the memory cells, said central processing unit receiving information as to the real time from the time signal generating means and information as to the tariff related to said real time from the memory unit;

a read out means for the contents of the memory cells;

there being at least two groups of the memory cells;

the number of groups of memory cells corresponding to the number of particular portions of the billing period for which separate power and/or energy values are to be obtained;

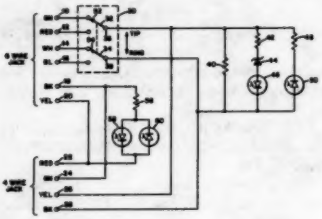
each group including first cells separately storing the various tariffs applying to different periods within a day and night belonging to the particular partial period associated with said group, and second cells separately storing the power and/or energy values calculated for said particular partial period;

the groups being successively connected to the central processing unit under the control of the time signal generating means.

4,701,699
TELEPHONE STATION TESTING APPARATUS

Terry E. Hoff, Noblesville, Ind., assignor to General Telephone Company of Indiana, Ft. Wayne, Ind.

Filed Sep. 4, 1985, Ser. No. 772,483
Int. Cl.[4] H04B *3/46;* G01R *19/14*
U.S. Cl. 324—133 6 Claims



1. testing apparatus comprising:

a first six wire jack having first, second, third, fourth, fifth and sixth conductors;

a second four wire jack having first, second, third and fourth conductors, the fifth conductor of the first jack being connected to the second conductor of the second jack, the sixth conductor of the first jack being connected to the first conductor of the second jack;

a first network connected between the fifth conductor of the first jack and the first conductor of the second jack, said network having, in series connection, a first resistor and a first LED, the first LED being shunted by a second LED, said first and second LEDs having opposite polarities;

a second resistor connected between the third and fourth conductors of the second jack;

a second network shunting said second resistor and having, in series connection, a third resistor, a zener diode and a third LED;

a third network shunting said second network and having, in series connection a fourth resistor and a fourth LED, said third and fourth LEDs having opposite polarities; and

a manually operated two position switch connected between the first, second, third and fourth conductors of the first jack and the third and fourth conductors of the second jack, said switch having a first position at which the first and third conductors of the first jack are connected to the third and fourth conductors respectively of the second jack while the second and fourth conductors of the first jack are disconnected, said switch having a second position at which the second and fourth conductors of the first jack are connected to the third and fourth conductors respectively of the second jack while the first and third conductors of the first jack are disconnected.

4,701,700
CAPTIVATED, PRE-LOADED SPRING MEANS FOR VACUUM DISPLACED CIRCUIT BOARD TESTING

Jack E. Jenkins, 6322 Temple City Blvd., Temple City, Calif. 91780

Filed Dec. 2, 1985, Ser. No. 803,161
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—158 F 11 Claims

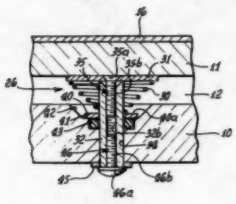
1. In a circuit board testing apparatus, the combination comprising

(a) structure including two generally parallel plates defining a space therebetween to which vacuum is applicable, there being circuit test probes projecting toward said space, and associated with one or the other of the plates, the remaining plate adapted to receive a circuit board for circuit testing,

(b) pre-loaded, resiliently deflectible means including captivated pre-compressed springs carried by one or the other of the plates, so that said means projects into said space,

(c) there being seal means on said remaining plate to be engaged by the circuit board for positive pressure sealing in response to vacuum application to said space,

(d) whereby vacuum in said space effects said sealing as one of the other of the plates is relatively movable forwardly toward the other in response to said vacuum application, thereby to further resiliently load said preloaded means and to cause said probes to engage circuit board circuitry only after said sealing has been effected,



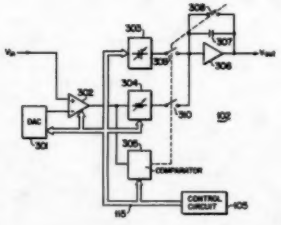
(e) said resiliently deflectible means being carried by said one plate and projecting into said space toward the other and remaining plate, to be engaged by said other plate in response to said plate relative movement,

(f) said resiliently deflectible means including spring captivating stops in said space, the springs confined between said stops and said one plate and being precompressed coil springs, the stops retained to said one plate independently of the other plate.

4,701,701
APPARATUS FOR MEASURING CHARACTERISTICS OF CIRCUIT ELEMENTS

Susumu Takagi, Hachioji, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 18, 1986, Ser. No. 887,675
Claims priority, application Japan, Jul. 19, 1985, 60-159538; Aug. 2, 1985, 60-170930; Aug. 2, 1985, 60-170931
Int. Cl.[4] G01R *31/26, 17/02*
U.S. Cl. 324—158 R 4 Claims



1. Apparatus for measuring characteristics of a circuit element, comprising:

an SMU capable of producing an output voltage at a first output terminal connected to the circuit element under test, measuring the current flowing through the first output terminal, and producing a measurement signal at a second output terminal proportional to the measured current, or producing an output current at a first output terminal connected to the circuit element under test, measuring the voltage appearing at the first output terminal, and producing a measurement signal at a second output terminal porportional the the measured voltage;

means responsive to the measurement signal and to a reference value, for producing an error signal representing the difference between the measurement signal and the reference value;

a comparator responsive to the error signal to operate an integrator in two modes, in the first mode providing a varying output voltage or current to the first output terminal of the SMU until the error signal reaches zero for the first time, and thereafter entering the second mode, integrating the error signal to provide a negative feedback signal to the first output of the SMU to maintain the measurement signal at the reference value; and

a control circuit for controlling the SMU, the comparator and the integrator and for setting the reference value.

4,701,702

CONTACT PIN HAVING A SPRING UNDER TENSION

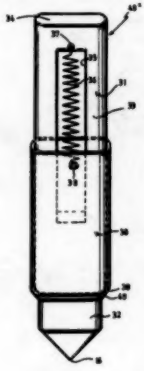
Gustav Krüger, Herrenberg, Fed. Rep. of Germany, assignor to Feinmetall GmbH, Herrenberg, Fed. Rep. of Germany

Division of Ser. No. 709,169, Mar. 7, 1985. This application Jan. 16, 1987, Ser. No. 4,102

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408375

Int. Cl.⁴ G01R *1/06*

U.S. Cl. 324—158 P **9 Claims**



1. A spring-loaded contact pin for contacting a test piece for its electrical operativeness, comprising:

an elongated conductive casing of oval cross section, open at opposite ends and formed with a pair of generally planar sides joined by rounded edges such that, in cross section, said casing forms an oval having a longitudinal axis parallel to said sides and along which a major dimension of the oval cross section is at least twice a transverse dimension thereof as measured along a transverse axis perpendicular to said sides, said casing being of uniform cross section over its entire length;

a conductive plunger slidable in said casing and of an oval cross section corresponding to that of said casing, said plunger having a pointed tip at one end projecting from one of said ends of said casing and being formed opposite at a shank of said plunger remote from said tip with a window elongated along a longitudinal axis of said plunger; and

a tension spring received in said window and anchored to said casing and said plunger for resiliently urging said tip out of said casing.

4,701,703

BED-OF-PINS TEST FIXTURE

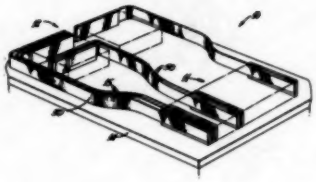
James T. Malloy, Riverside, Calif., assignor to Philip M. Hinderstein, Newport Beach, Calif., a part interest

Continuation-in-part of Ser. No. 66,093, Aug. 13, 1979, Pat. No. 4,340,858. This application Sep. 20, 1982, Ser. No. 425,129

Claims priority, application PCT Int'l Appl., Mar. 5, 1982, PCT/US82/00269

Int. Cl.⁴ G01R *31/02, 1/06*

U.S. Cl. 324—158 F **2 Claims**



1. For use in an automatic test system having the capability of electrically testing different types of generally planar boards, each type of board having a plurality of electrical test points arranged in a preselected pattern on a predetermined two dimensional grid,

a test fixture including:

a plurality of planar members;

a plurality of modular housing components which are adapted to be stacked together in a side-to-side array;

each housing component being made of an insulating material and having (a) a predetermined size and shape, including a planar top and wall elements, at least one wall element having therein a recess adapted to receive at least a portion of a planar member, and (b) a plurality of parallel compartments spaced apart in at least one row, said compartments terminating in open ends in said top of said housing component on said grid pattern,

a plurality of conductive pin means, individual ones of said pin means being positioned in individual ones of said compartments so that one segment of each of said pin means extends outwardly from the open end of the compartment in which it is positioned and another segment of the pin means extends into the compartment in which it is positioned;

spring means which urge said one segment of the pin means towards the selected board under the test, so that during testing electrical contact is made between said board under test and said pin means;

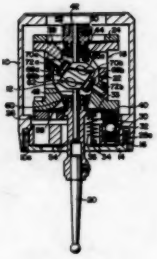
a plurality of electrical leads carried by said planar members, with individual ones of said leads being adapted to be connected electrically to individual ones of said pin means upon stacking of the planar members and housing components together in side-to-side array,

means for supporting the housing components and the planar members in a stacked array with individual housing components arranged side-to-side, with individual planar members being between adjacent housing components with a portion of each of said individual planar members being received in individual recesses in the wall elements, so that the housing components, planar members, and pin means form the test fixture with the pin means being arranged in a pattern corresponding to the preselected pattern of the board under test with individual electrical leads being electrically connected to individual pins.

4,701,704
NON-DIRECTIONAL TOUCH SIGNAL PROBE

Minoru Fukuyoshi; Takashi Furuto, and Tetsuo Nakamura, all of Kanagawa, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1985, Ser. No. 768,503
Claims priority, application Japan, Aug. 23, 1984, 59-175766
Int. Cl.[4] G01B 7/28, 7/14
U.S. Cl. 324—207 4 Claims

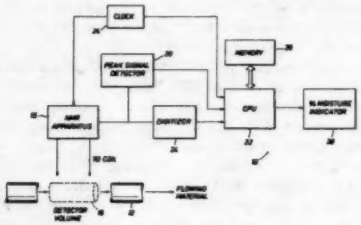


1. A touch signal probe for electrically detecting the contact of a touch pin with a work, comprising a probe case and a touch pin base positioned within said probe case to be movable in multi-directions and having a single dwell position, said base carrying said touch pin, said probe being characterized in that said probe comprises upper and lower diaphragms respectively mounted on the upper and lower portion of said touch pin base, said diaphragms supporting a touch pin holder body carrying said touch pin to be movable ralative to said touch pin base and in that said probe comprises a plurality of pairs of cores mounted on said touch pin holder body and a plurality of other pairs of detection coils mounted on said touch pin base respectively opposing to the respective one of said pairs of cores, whereby the motion of said touch pin in the multi-directions can electrically be detected by cooperation between said pairs of cores and said pairs of detection coils.

4,701,705
NMR MOISTURE MEASUREMENTS

William L. Rollwitz, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Dec. 5, 1983, Ser. ... 558,770
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—306 22 Claims



1. A method of measuring moisture in a flowing material which moisture is subject to different bonding mechanisms as a function of percent water concentration comprising the steps of:

(a) in a flowing material subject to interrogation, obtaining by a transient response a NMR response indicative of the total hydrogen population in an NMR detection volume for the flowing material;

(b) plotting the transient NMR response as a function of time after interrogation;

(c) extending selected portions of the plotted NMR response to an intercept at time equals zero to obtain intercept values A and B, the portions being selected to define at least two straight line segments;

(d) determining K and M from the slope of the straight line portions of the plotted NMR response where K and M are characteristic for different water binding mechanisms in the flowing material; and

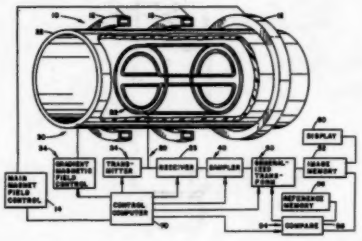
(e) determining with the intercept values a moisture relationship for different water binding mechanisms given by

$$Ae^{-kt}+Be^{-mt}.$$

4,701,706
GENERALIZED RECONSTRUCTION TECHNIQUE

E. Mark Haacke, University Hts., Ohio, assignor to Picker International, Inc., Highland Hts., Ohio

Continuation-in-part of Ser. No. 731,509, May 7, 1985. This application Aug. 9, 1985, Ser. No. 764,439
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—309 19 Claims



1. A method of magnetic resonance imaging comprising:

generating a main magnetic field through an image region which tends to align magnetic dipoles of nuclei to be imaged therewith;

cyclically exciting precession of the magnetic dipoles of the imaged nuclei about the main magnetic field, each nuclei generating radio frequency components of a resonance signal as dipole precession decays toward alignment with the main magnetic field;

causing magnetic field gradients across the main magnetic field to vary a phase and frequency of resonance signal components generally in accordance with a spatial position of the generating nuclei, the relationship between the spatial position and at least one of the phase and frequency being non-uniform such that Fourier transforming the resonance signal into real space would produce a distorted image representation;

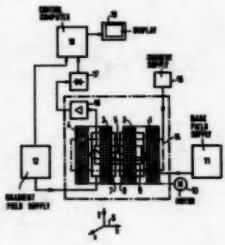
operating on the resonance signal with a generalized transform which concurrently (1) corrects for the non-uniformity between the spatial position and at least one of the phase and frequency and (2) transforms the resonance signal into a respresentation of the spatial position and density of the imaged nuclei.

4,701,707

MAGNETIC RESONANCE DIAGNOSTIC DEVICE

Hermann Riedl, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 30, 1985, Ser. No. 781,452
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1984, 3439331
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 14 Claims



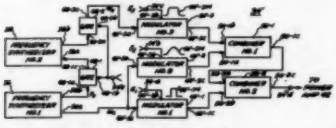
1. A magnetic resonance diagnostic device comprising:
means for generating a fundamental magnetic field of constant magnitude in which an examination subject is disposed;
means for generating a plurality of gradient magnetic fields in which said examination subject is also disposed;
means for detecting changes in the nuclear magnetic resonance of said examination subject from an equilibrium position; and
means for continuously changing the direction of said fundamental magnetic field for inducing said nuclear magnetic resonance changes.

4,701,708

POLARIZATION TRANSFER BY SELECTIVE HOMONUCLEAR TECHNIQUE FOR SUPPRESSION OF UNCOUPLED SPINS IN NMR SPECTROSCOPY

Christopher J. Hardy, Schenectady, and Charles L. Dumoulin, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1986, Ser. No. 891,823
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—311 18 Claims



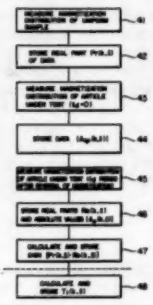
1. An NMR spectroscopy method for obtaining from a sample a processed spectrum including at least one desired coupled-spin resonance response signal from that sample and in which is substantially suppressed at least one undesired one of uncoupled-spin and coupled-spin resonance response signal, comprising the steps of:
(1) immersing the sample in a static magnetic field B_0;
(2) providing at least one pair of alternating sequences of pulses of a radio-frequency (RF) magnetic field B_1 signal in the sample, each sequence having
(a) a substantially 90° initial RF signal pulse for nutating the desired coupled-spin resonances and the at least one undesired resonance about a first axis of a Cartesian coordinate system imposed upon the sample,
(b) a substantially 180° RF signal pulse for rotating the spin resonances about the first axis, and having a temporal midpoint occurring substantially after a time interval T after the temporal midpoint of the initial pulse, where $T=n/4J$, n is a positive odd integer and J is the spin coupling constant of the desired nucleus type, and
(c) a substantially 180° final RF signal pulse for rotating the spin resonances about the first axis, and having a temporal midpoint occurring after a time interval 2T after the temporal midpoint of the first 180° RF signal pulse of that sequence;
(3) providing only one of each sequence pair with a polarization transfer 180° RF signal narrowband pulse, having a temporal midpoint occurring after a time interval T after the temporal midpoint of the first 180° RF signal pulse of that sequence, and having a frequency different from the frequency of each of the at least one undesired uncoupled-spin resonance;
(4) acquiring for each sequence a set of response data during a response gating period including a temporal point thereof occurring after a time interval T after the final RF signal pulse of that sequence;
(5) subtracting one of the sequentially acquired pair of response data sets from the other to provide a difference data set; and
(6) displaying the difference data set as the processed spectrum of the sample.

4,701,709

NMR IMAGING METHOD

Etsuji Yamamoto, Akishima; Hideki Kohno, Tokyo, and Ryuzaburo Takeda, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 16, 1985, Ser. No. 766,195
Claims priority, application Japan, Aug. 17, 1984, 59-170413
Int. Cl.[4] G01R *33/20*; G01N *24/08*
U.S. Cl. 324—312 8 Claims



1. An NMR imaging method comprising the steps of:
(a) measuring a magnetization distribution of a homogeneous phantom by a first sequence of a Fourier imaging method, and storing real parts, imaginary parts or the signs thereof of image-reconstructed data thus measured into a first memory;
(b) measuring a magnetization distribution of an article under test by a second sequence of a Fourier imaging method and storing real parts, imaginary parts or the signs thereof and absolute values of image-reconstructed data thus measured into second and third memories, respectively; and
(c) multiplying at respective coordinates the real part, imaginary part, or the sign thereof, of the data stored in said first memory by the real part, imaginary part, or the sign thereof, of the data stored in said second memory, and storing the signs at the respective coordinates in said third

memory as the signs of the image reconstructed data represented by the absolute values in said third memory.

4,701,710
NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS

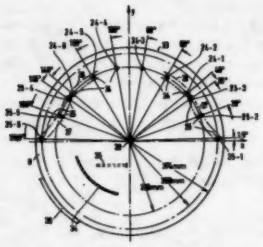
Ludger Freisen, Erlangen; Helmut Kess, Nuremberg; Norbert Krause, Heroldsbach, and Ralph Meissner, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 22, 1985, Ser. No. 736,768

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1984, 3421291

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 **7 Claims**



2. A nuclear magnetic resonance tomography apparatus for examining an examination subject, said apparatus comprising:

means for generating a fundamental magnetic field in which said subject is disposed;

means for generating a plurality of orthogonal gradient magnetic fields in which said subject is also disposed; and

an antenna system for inducing spins of selected nuclei in said subject and for receiving nuclear magnetic resonance signals as a result thereof, said antenna system consisting of a plurality of groups of parallel conductive rod elements arranged around a longitudinal axis, all rod elements in a group being interconnected by a respective conductive member of each group attached to the ends of the rods in the group, each group of rod elements being respectively sensitive to a resonant frequency for a different type of atomic nucleus, and at least one of said groups including rod elements spaced at different distances from said axis.

4,701,711
NUCLEAR MAGNETIC RESONANCE APPARATUS WITH SWITCHED ATTENUATOR

Reginald A. Willard, Middlesex, and William S. Percival, London, both of England, assignors to National Research Development Corporation, London, England

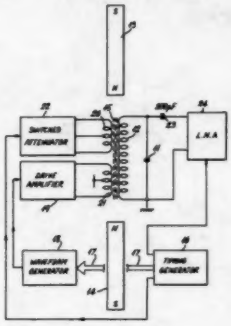
Filed Apr. 30, 1986, Ser. No. 857,310

Claims priority, application United Kingdom, May 3, 1985, 8511354; May 3, 1985, 8511382

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—322 **10 Claims**

1. A resonant circuit for use where rapid attenuation of oscillations in the circuit is required on demand, comprising an inductor having a first winding, a second winding in two halves defined by a centre tap, reactive impedance connected across the first winding to form a resonant circuit, first and second switching devices, each said device having a control electrode and two other electrodes, an application of a suitable control signal to the control electrode changing the device from a non-conducting state in which the impedance between the said other electrodes is substantially open circuit to a conducting state in which the said impedance has a low value, the said devices being arranged when in the conducting state to connect resistance means across the second winding, with the connection such that transient voltages occurring when the devices enter their non-conducting states are in opposition in the two halves of the second winding, bias means for biassing the devices into the non-conducting state, and pulse generating means for applying switching pulses to control electrodes



causing the devices to enter the conducting state when oscillations in the resonant circuit are to be attenuated, the combined resistance of the resistance means and the devices when conducting, when referred to the first winding being substantially equal to half the reactance of the inductor when also referred to the first winding.

4,701,712
THERMOREGULATED MAGNETIC SUSCEPTIBILITY SENSOR ASSEMBLY

Robert L. Seeley, Denver; Joseph J. Barth, Lakewood, and Gerald H. Clayton, II, Northglenn, all of Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 12, 1982, Ser. No. 357,363

Int. Cl.[4] G01V *3/10, 3/18, 3/08;* **G01N** *33/12*

U.S. Cl. 324—340 **11 Claims**

1. A thermoregulated magnetic susceptibility sensor assembly for use in measuring the magnetic susceptibility of rocks in the earth comprising:

a non-mettallic container normally closed to the passage of fluids therefrom;

a sensing solenoid comprising an elongated core and a coil wound around said core, said sensing solenoid being mounted within the container and spaced from the walls of said container;

a plurality of separate heaters located in said container and arranged uniformly about said sensing solenoid along its length and spaced therefrom to provide an even distribution of heat to the solenoid; and

a heat transfer material within said container filling the space between said plurality of heaters and said sensing solenoid and contacting them for ensuring that the heat produced

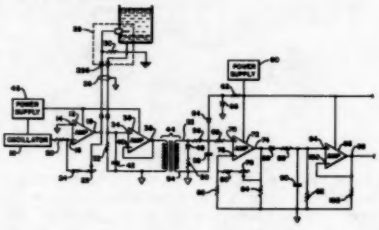
by said plurality of heaters is substantially uniformly conducted to said sensing solenoid so as to maintain said sensing solenoid at a uniform temperature during the use of the sensor in making magnetic susceptibility measurements.

4,701,713

OIL AND FUEL CONTAMINATION MONITORING SYSTEM

Favre E. Eaton, Winsted; James F. Brazant, Branford, and Lawrence E. Thornton, Simsbury, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 20, 1984, Ser. No. 683,845
Int. Cl.[4] G01R *27/22*
U.S. Cl. 324—442 **28 Claims**



1. A contamination monitoring system for detecting and indicating the resistance of a nonconductive fluid near a drain port of an earth grounded conductive reservoir, comprising:

a. means for generating an alternating current signal;

b. probe means adapted to be mounted in a drain port of the reservoir for applying the alternating current signal to the nonconductive fluid, said probe means having

(i) an electrically conductive electrode extending into and electrically insulated from the earth grounded reservoir, the electrode immersed in the nonconductive fluid and having the alternating current signal applied thereto,

(ii) a housing having a fluid passage in fluid communication with the reservoir for passing fluid therefrom,

(iii) closure means in the fluid passage for permitting fluid passage therethrough when opened and preventing fluid passage therethrough when closed, and

(iv) a first resistance electrically in parallel with the path from the alternating current generating means through the nonconductive fluid to earth ground;

c. voltage divider means connected between the signal generating means and signal ground for providing a divided voltage point, comprised of the first resistance in parallel with the probe means, said voltage divider means also having a second resistance in series with the first resistance, a first end of the second resistance connected at the divided voltage point to the first resistor and earth ground and a second end of the second resistor connected to signal ground;

d. voltage detection means connected to the divided voltage point for manifesting a detected voltage signal at the divided voltage point;

e. isolation means for electrically isolating the detected voltage signal from the electrical circuit containing the alternating current signal generating means resulting in an isolated electrical signal indicative of the resistance of a path between the alternating current signal generating means and the divided voltage point;

f. means for evaluating the isolated electrical signal to determine the resistance of a path between the alternating current signal generating means and the divided voltage point, thereby determining the degree of conductive contamination in the nonconductive fluids;

g. means for comparing the path resistance to a predetermined path resistance set point resulting in a compared path resistance signal;

h. means for indicating normal contamination levels when the path resistance is greater than the predetermined path resistance set point; and

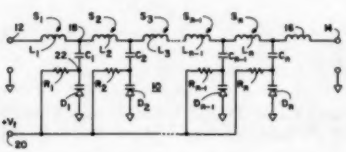
i. means for indicating abnormal contamination levels when the path resistance is less than the predetermined path resistance set point.

4,701,714

TUNABLE DELAY LINE

Agoston Agoston, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 31, 1986, Ser. No. 846,320
Int. Cl.[4] H01C *1/082;* H03K *3/26, 5/13;* H03H *7/18*
U.S. Cl. 328—56 **5 Claims**



1. In a lumped-parameter electrical delay line having

an input terminal receiving a signal to be delayed,

an output terminal delivering the signal delayed,

a first inductance and a second inductance connected in series between said input terminal and said output terminal,

a shunt capacitance connected from a junction between said first and second inductances to a common terminal,

wherein the improvement comprises:

siad shunt capacitance including a variable capacitance diode, and

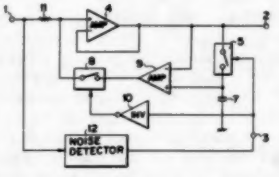
control voltage means coupled to said variable capacitance diode for electrically varying the delay of said delay line.

4,701,715

PRECEDING VALUE HOLDING GATE CIRCUIT FOR ELIMINATING PULSIVE NOISES

Kiyoshi Amazawa, and Akira Mori, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1986, Ser. No. 937,259
Claims priority, application Japan, Dec. 5, 1985, 60-272495
Int. Cl.[4] H03B *1/04;* H04B *1/10*
U.S. Cl. 328—165 **1 Claim**



1. A gate circuit comprising:

a buffer amplifier means connected between an input terminal and an output terminal;

a noise detecting means for detecting noise components in an input signal applied to said input terminal and producing a control signal;

a first switching means having one end connected to said

output terminal and normally taking its on-position but changed to its off-position by said control signal from the noise detecting means;

a signal holding means connected to the other end of said first switching means;

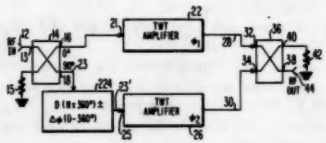
a level comparator means for detecting a difference between signal levels at both ends of said first switching means; and

a second switching means having one end connected to said input terminal and the other end connected to the output of said level comparator means and normally taking its off-position but changed to its on-position by said control signal.

4,701,716
PARALLEL DISTRIBUTED SIGNAL AMPLIFIERS

Joseph J. Poole, Essex County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 7, 1986, Ser. No. 860,490
Int. Cl.[4] H03F *3/58, 3/68*
U.S. Cl. 330—43 **16 Claims**



10. A power amplifier, comprising:

signal splitting means adapted to be coupled to a source of signal to be amplified and including a first plurality of output ports at each of which divided signals appear:

a first plurality of signal amplifiers, each including an input port coupled to an output port of said signal splitting means for receiving divided signals and an output port at which amplified signal is generated in response to said divided signals, each of said first plurality of signal amplifiers having a signal delay between its said input port and output port, the phase difference corresponding to the difference in said signal delays between two of said signal amplifiers being in excess of 360°;

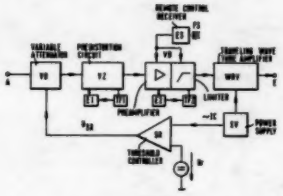
signal combining means coupled to said output ports of said first plurality of signal amplifiers for combining said amplified signals from said first plurality of signal amplifiers to produce a sum signal, whereby phase coincidence within 360° of said amplified signals is necessary for producing the maximum value of said sum signal, but may not provide maximum instantaneous bandwith; and

delay means coupled to said first plurality of signal amplifiers for delaying the signal through those signal amplifiers among said first plurality of signal amplifiers having said signal delay which is less than the delay of that one signal amplifier among said first plurality of said amplifiers having the greatest signal delay, said delay means being selected not only for providing phase coincidence within 360° but also for equalizing said signal delay through said first plurality of signal amplifiers whereby said sum signal and said instantaneous bandwidth are maximized.

4,701,717
OPERATING POINT-STABILIZED LINEARIZED TRAVELING WAVE TUBE AMPLIFIER

Wilhelm Radermacher, Sindelfingen-Maichingen, and Johannes Czech, Allmersbach im Tal, both of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Jun. 20, 1986, Ser. No. 876,936
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1985, 3522408
Int. Cl.[4] H03F *1/33*
U.S. Cl. 330—149 **11 Claims**

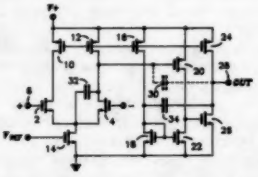


1. In an operating point-stabilized, linearized traveling wave tube transmission amplifier arrangement including a traveling wave tube amplifier having the series connection of a predistortion circuit means, for compensating for the non-linearities in said traveling wave tube amplifier, and a preamplifier with limiter circuit connected in the input signal path for said traveling wave tube amplifier; the improvement comprising: first means for limiting the output power of said traveling wave tube amplifier including a variable attenuator connected in said input signal path before said predistortion circuit means, means for deriving a signal which is a measure of the output power of said traveling wave tube amplifier, and a threshold controller means, which is responsive to said signal from said means for deriving, for providing an output control signal for controlling said variable attenuator; and second means, responsive to a remote control signal whose information content is determined by an analysis of an intermodulation measurement of said traveling wave tube transmission amplifier arrangement, for regulating said preamplifier with limiter circuit to provide compensation for aging effects.

4,701,718
CMOS HIGH GAIN AMPLIFIER UTILIZING POSITIVE FEEDBACK

Robert S. Wrathall, Tempe, and Judy L. Sutor, Phoenix, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jun. 30, 1983, Ser. No. 509,574
Int. Cl.[4] H03F *3/16, 3/45*
U.S. Cl. 330—253 **6 Claims**



1. A CMOS operational amplifier of the type which includes an inverting input, a non-inverting input and an output, comprising:

an input stage including a first input N-channel field effect transistor having a gate coupled to said non-inverting input, and having source and drain electrodes; a second

N-channel field effect transistor having a gate coupled to said inverting input and having source and drain terminals; a third N-channel field effect transistor having a gate coupled to a source of a reference voltage, a drain coupled to the sources of said first and second transistors, and a source coupled to a first source of supply voltage; a first P-channel field effect transistor having a source coupled to a second source of supply voltage and having a gate coupled to its drain and to the drain of said first N-channel field effect transistor; and a second P-channel field effect transistor, having a source coupled to said second source of supply voltage, a gate coupled to the gate of said first P-channel field effect transistor and a drain coupled to the drain of said second N-channel field effect transistor, said first and second P-channel field effect transistors being coupled in current mirror relationship with said first and second N-channel field effect transistors and said third N-channel field effect transistor acting as a current sink;

a bias stage coupled between said output and said input stage for internally biasing said output in its active region;

a first gain stage coupled to said bias stage and to said input stage;

a second gain stage coupled to said input stage, said first gain stage and to said output; and

a first capacitor coupled between said output and the input of said first gain stage for producing positive feedback and improving the frequency performance of said amplifer.

4,701,719

DIFFERENTIAL AMPLIFICATION CIRCUIT

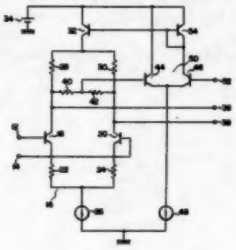
Minoru Nagata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 9, 1986, Ser. No. 883,724

Claims priority, application Japan, Jul. 11, 1985, 60-104863[U]

Int. Cl.[4] H03F 3/45

U.S. Cl. 330—258 **11 Claims**



1. A differential amplification circuit able to generate an output having a controlled in-phase component, said circuit comprising:

a first differential amplifier for amplifying the differential component of an input signal;

a current source coupled to the first differential amplifier;

a detection circuit for detecting the in-phase component of an output signal of the first differential amplifier; and;

a second differential amplifier for detecting the difference between the in-phase component detected by the detection circuit and a reference value and for varying the current supplied from the current source, in accordance with the detected difference, thereby to control the in-phase component.

4,701,720

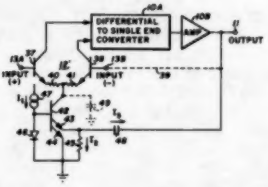
CAPACITIVE FEEDBACK TO BOOST AMPLIFIER SLEW RATE

Dennis M. Monticelli, Fremont, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 28, 1986, Ser. No. 856,315

Int. Cl.[4] H03F 3/45

U.S. Cl. 330—260 **6 Claims**



1. An integrated circuit amplifier having an input for receiving an input signal, and a single-ended output for reproducing said signal, said circuit comprising:

an operational amplifier having inverting and noninverting inputs obtained by employing an input stage composed of a differentially connected pair of input transistors commonly operated by a current source which includes means for summing an additional current from a separate source; and

a capacitor coupled between said single-ended output and said current source whereby a positive feedback current proportional to the time rate of change in potential at said output is coupled to said current source to provide said additional current.

4,701,721

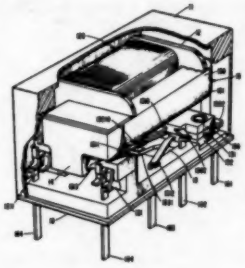
CORE FORMED OF HARD AND SOFT MAGNETIC MATERIALS FOR AN ELECTRICAL RELAY APPARATUS

Harold E. McCullough, Blacklick, Ohio, assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 11, 1986, Ser. No. 906,022

Int. Cl.[4] H01H 51/22

U.S. Cl. 335—79 **11 Claims**



1. An electromechanical relay (1) having an armature (14) and a spring assembly (13) mounting contacts comprising

electromagnetic means (12, 15) for activating said armature to operate said spring assembly to engage and disengage said contacts

characterized in that

said electromagnetic means comprises

means (15) having a first region formed of a soft magnetic material (151) and a second region formed of a hard mag-

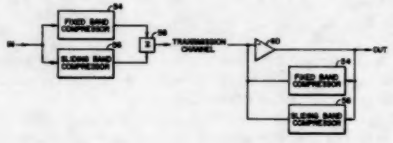
netic material (150) superimposed on said soft magnetic material forming pole areas (152) with magnetic flux generated by said pole areas normally returned through said soft magnetic material and enabled by an electrical current in a coil winding (120) encircling said electromagnetic means for magnetizing said soft magnetic material to aid said pole areas in activating said armature.

4,701,722

CIRCUIT ARRANGEMENTS FOR MODIFYING DYNAMIC RANGE USING SERIES AND PARALLEL CIRCUIT TECHNIQUES

Ray M. Dolby, 3340 Jackson St., San Francisco, Calif. 94118

Filed Jun. 17, 1985, Ser. No. 744,965
Int. Cl.[4] H04B 1/64
U.S. Cl. 333—14 10 Claims



1. A circuit for modifying the dynamic range of an input signal, comprising

variable gain circuit means,

variable pass filter circuit means, said variable pass filter circuit means providing a boost or cut in a high or low frequency region of the signal band, and responsive to signals in that region to cause the filter means corner frequency to slide in the sense narrowing the boosted or cut region,

means for connecting said circuit means in parallel,

means for coupling the input signal to the parallel arrangement of said circuit means, and

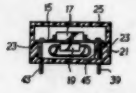
means for deriving an output signal from the parallel arrangement of said circuit means.

4,701,723

CONNECTION CONSTRUCTION FOR ELECTRONIC COMPONENT

Kazuo Kameya, Isurugashima, Japan, assignor to Elmec Corporation, Saitama, Japan

Filed Feb. 5, 1986, Ser. No. 826,347
Claims priority, application Japan, Feb. 5, 1985, 60-14974[U]
Int. Cl.[4] H01P 5/02
U.S. Cl. 333—33 10 Claims



1. A connection construction for an electronic component, comprising:

a circuit board;

a circuit pattern formed on the circuit board;

at least one external connection terminal connected to the circuit pattern and projecting substantially perpendicularly from the circuit board, said at least one external connection terminal being of elongated shape and having a first wide portion and a second narrower portion;

a dielectric plate having a first surface and a second surface, the first surface of the dielectric plate being affixed to only the first portion of said at least one external connection terminal, the second portion projecting downwardly therefrom for external connection; and

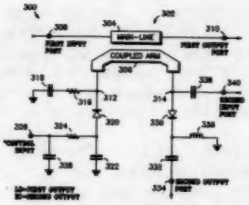
a ground electrode affixed to the second surface of the dielectric layer.

4,701,724

INJECTION SWITCH AND DIRECTIONAL COUPLER

William J. Martin, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 15, 1986, Ser. No. 885,890
Int. Cl.[4] H01P 1/15
U.S. Cl. 333—103 8 Claims



1. A switch, comprising in combination:

a directional coupler having first and second nodes and a coupling arm connected between said nodes;

terminating means, connected to said first node, for terminating said directional coupler, said terminating means having selectable zero and non-zero terminating impedances, said terminating means includes a resistor coupled between said first node and ground, and a diode connected to said first node; and

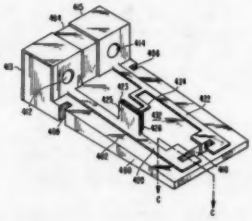
switching means, connected to said second node, said switching means having an output, for selectively coupling said second node to said output.

4,701,725

RADIO FREQUENCY SIGNAL COUPLER

Denis P. Dorsey, Levittown, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed May 30, 1986, Ser. No. 869,176
Int. Cl.[4] H03H 7/01, 5/12; H02H 3/22
U.S. Cl. 333—185 4 Claims



1. Apparatus for coupling a source of a radio frequency (RF) signal to an RF signal processing circuit, comprising:

an electrically insulating body portion;

first and second input coupling means formed on said body portion for coupling to said source;

first and second output coupling means formed on said body portion for coupling to said RF signal processing circuit;

a first conductor formed on said body portion and coupled

between said first input coupling means and said first output coupling means;

a second conductor formed on said body portion and coupled between said second input coupling means and said second output coupling means;

resonant circuit means formed on said body portion and coupled between said first and second conductors for providing a series resonant circuit therebetween;

said resonant circuit means including inductance means formed on said body portion for providing series inductance and capacitance means formed on said body portion for providing series capacitance;

said resonant circuit means including a third conductor having a meander portion for forming said inductance means and a gap portion for forming said capacitance means; wherein

said first, second, and third conductors are formed in a first plane as substantially flat strips on said body portion;

said third conductor includes first and second plate portions defining said gap therebetween; and

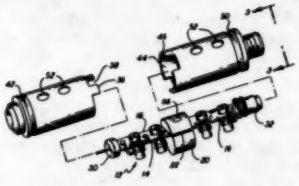
said body portion includes a tab portion having first and second faces located in respective second and third parallel planes, said second and third planes being substantially perpendicular to said first plane and having a separation therebetween substantially equal to said gap, said first and second plate portions of said third conductor being formed on respective ones of said second and third planes.

4,701,726

TRAP FILTER ASSEMBLY

Timothy M. Holdsworth, Clay, N.Y., assignor to Northeast Filter Co., Inc., Syracuse, N.Y.

Filed Dec. 3, 1985, Ser. No. 804,063
Int. Cl.[4] H03H *7/00*
U.S. Cl. 333—185 **20 Claims**



1. A filter assembly for a channel blocking filter of the type which is fine tuned to attenuate a selected channel or band of channels and then is sealed moisture tight; comprising

a circuit board having printed filter pole circuit areas formed thereon on each side of a central grounding area, with adjustable filter circuits being disposed in said filter pole circuit areas, ground pads formed on said central area and communicating with said adjustable filter circuits, a signal lead printed on said central grounding area out of contact with said pads and connecting said filter circuits, a first connector at one end of said printed circuit board connected to one said filter circuit, and a second connector at the other end of said printed circuit board and connected to the other said filter circuit;

a generally cylindrical metal ground block of a predetermined diameter and having a cylindrical surface and circular ends, and having a chord cutout open at the ends and along said cylindrical surface, said cutout being dimensioned so as to permit said ground block to fit snugly against said central grounding area of said board and to press against said ground pads to form a solderless connection therewith, said block including means holding said ground block out of contact with said signal lead;

a first metal housing half having a cylindrical inside diameter of said ground block and overfitting said first connector, one said printed filter pole circuit area, and a portion of said ground block, said first housing half making solderless electrical contact with said ground block substantially over its circumference;

a second metal housing half having a cylindrical inside surface of a diameter not greater than the predetermined diameter of said ground block and overfitting said second connector, the other said printed filter pole circuit area and the remainder of said ground block, said second housing half making solderless electrical contact with said ground block substantially over its circumference;

said metal housing halves including means permitting tuning of said adjustable filter circuits after assembly of said housing halves over said circuit board and said ground block; and

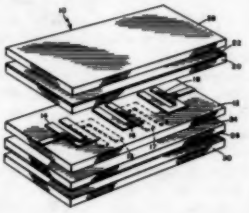
sealing sleeve means environmentally sealing said housing halves.

4,701,727

STRIPLINE TAPPED-LINE HAIRPIN FILTER

Joseph S. Wong, Upland, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Nov. 28, 1984, Ser. No. 675,782
Int. Cl.[4] H01P *1/203*
U.S. Cl. 333—204 **12 Claims**



1. A stripline tapped-line hairpin filter comprising:

a first dielectric substrate;

a plurality of hairpin resonators disposed alternately on opposite surfaces of said first substrate, certain ones of said hairpin resonators located on one surface of said first substrate and certain other ones of said hairpin resonators located on the other surface of said first substrate with said first substrate separating said certain ones of said hairpin resonators from said certain other ones of said hairpin resonators and said certain ones and said certain other ones of said hairpin resonators having noncongruent adjacent edges, each hairpin resonator positioned in a spaced parallel relationship with respect to an adjacent hairpin resonator located on an opposite surface of said first substrate such that each hairpin resonator is in a parallel coupled relationship with an adjacent hairpin resonator disposed on an opposite surface of said first substrate, and the first and last hairpin resonator on said first substrate each includes an interconnected tapping member disposed upon a surface of said first substrate to which the corresponding first and last hairpin resonator is disposed and respectively extends toward opposite ends of said first substrate for respectively coupling a signal into and out of said hairpin resonators;

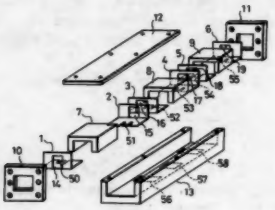
second and third dielectric substrates each having a pair of surfaces, one surface of said second substrate located adjacent to said certain ones of said hairpin resonators and one surface of said third substrate located adjacent to said certain other ones of said hairpin resonators; and

first and second groundplanes each having a pair of surfaces, one surface of said first groundplane mounted upon said second substrate other surface and one surface of said second groundplane mounted upon said third substrate other surface.

4,701,728
WAVEGUIDE FILTER

Sadao Igarashi, Soma, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Sep. 2, 1986, Ser. No. 902,861
Claims priority, application Japan, Sep. 6, 1985, 60-137234; Sep. 6, 1986, 60-198059
Int. Cl.[4] H01P *1/208, 7/06, 3/12*
U.S. Cl. 333—212 4 Claims

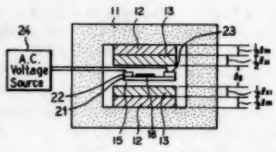


1. A waveguide filter comprising:
waveguides each of which has a length matched to the center frequency of the passband of the bandpass filter formed by the waveguide filter, each waveguide assuming a U-shaped cross section when taken at right angles to the longitudinal direction;
shunt inductor plates each of which has first and second planes meeting at right angles and assumes an L-shaped form, each first plane covering the corresponding one of the open longitudinal ends of the waveguides, each second plane covering the corresponding one of the open bottoms of the waveguides, each first plane being provided with an induction window, the shunt inductor plates bearing on their corresponding waveguides to form waveguide resonators; and
a support on which the waveguide resonators are longitudinally connected in series.

4,701,729
MAGNETIC APPARATUS INCLUDING THIN FILM YIG RESONATOR

Seigo Ito, Tokyo, and Yoshikazu Murakami, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,851
Claims priority, application Japan, Mar. 8, 1984, 59-44244
Int. Cl.[4] H01P *7/00*
U.S. Cl. 333—219 6 Claims

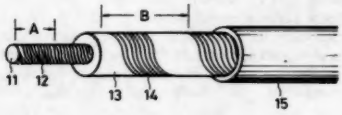


2. A magnetic resonator comprising:
a magnetic circuit including a rectangular shaped magnetic yoke having first, second, third and fourth legs being configured to enclose a central rectangular shaped opening and a pair of magnets mounted in said central rectangular opening and respectively, attached to said first and third legs, and a magnetic gap formed in said magnetic circuit between said first and third legs and in which a uniform d.c. biasing magnetic field is formed;
a thin film YIG ferrimagnetic resonator device, formed of a thin film of ferrimagnetic yttrium iron garnet of a selected composition, mounted in said magnetic gap between said pair of magnets so that said device operates in said d.c. biasing magnetic field; and
a pair of soft magnetic plates mounted in said d.c. biasing magnetic field and respectively connected to said pair of magnets adjacent said YIG ferrimagnetic resonator device, said pair of soft magnetic plates made of ferrimagnetic yttrium iron garnet which has substantially the same composition as said resonator device.

4,701,730
INDUCTIVE RADIO ANTENNA CABLE

Kunihiko Okamoto, Kanagawa, Japan, assignor to Hitachi Cable Ltd., Tokyo, Japan

Filed May 28, 1986, Ser. No. 867,667
Int. Cl.[4] H01P *3/06;* H01Q *13/20*
U.S. Cl. 333—237 2 Claims

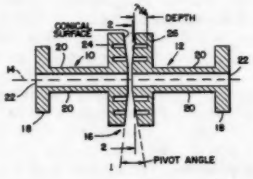


1. An inductive radio cable, comprising:
a core;
a conductor spirally wound around the outer periphery of said core to form an inner conductor;
an insulator around the outer periphery of the inner conductor; and
another conductor spirally wound around the outer periphery of the insulator in the same winding direction as the inner conductor to form an outer conductor;
wherein the spiral winding pitch of said outer conductor is not smaller than two times and not larger than three times the spiral winding pitch of said inner conductor.

4,701,731
PIVOTABLE CONICAL JOINT FOR WAVEGUIDES

Allan W. Hanson, Los Angeles, and Theron L. Christiansen, Hawthorne, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 23, 1986, Ser. No. 854,969
Int. Cl.[4] H01P *1/06*
U.S. Cl. 333—257 5 Claims



1. A joint for pivotally coupling two waveguides comprising:
a first flange assembly having a convex conical surface disposed about an end of a first one of said waveguides, and oriented transversely to a longitudinal axis of said first waveguide;
a second flange assembly having a convex conical surface facing said first flange assembly, said second flange assembly being disposed about an end of a second one of said waveguides, and oriented transversely to a longitudinal axis of said second waveguide;
means for pivotally mounting said first flange assembly relative to said second flange assembly with a spacing

therebetween of less than approximately one-twentieth wavelength of radation transmitted via said joint between said first and said second waveguides;

an assembly of chokes disposed along the conical surface of each of said flange assemblies, each choke assembly including a set of four chokes, there being in each flange assembly an inner choke and an outer choke on one side of said waveguide, and an inner choke and an outer choke positioned diametrically across the flange assembly on the opposite side of said waveguide, each choke being formed as a channel disposed within the conical surface in each of said flange assemblies and having the shape of a circular segment;

the chokes of each choke assembly being arranged with radial symmetry about a cone axis of the respective conical surfaces, the inner chokes on each surface being positioned alongside a broadwall of the respective waveguide in each of the flange assemblies; and

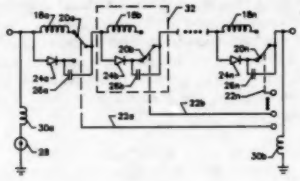
the radial spacing between a center line of each adjacent inner and outer choke being one-quarter wavelength at the midband frequency of radiation propagating through said joint.

4,701,732

FAST TUNING RF NETWORK INDUCTOR

C. Dale Nestlerode, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 16, 1986, Ser. No. 943,276
Int. Cl.[4] H03J *5/24*
U.S. Cl. 334—56 **21 Claims**



1. An inductor switching circuit having an input terminal and an output terminal, comprising:

an inductor having first and second terminals and having its first terminal coupled to the input terminal;

a diode having first and second terminals and having its first terminal coupled to the input terminal;

switching means for coupling the output terminal alternately to the second terminal of the inductor and the second terminal of the diode;

control means for selectively controlling the switching means to switch between the second terminal of the inductor and the second terminal of the diode;

a capacitor coupled between the second terminal of the diode and the output terminal; and

biasing means for providing bias energy through the input terminal and the output terminal.

4,701,733

POWER SUPPLY CIRCUIT INCLUDING A TRIP-SWITCH, AND AN ELECTRICAL OUTLET

Max R. V. Osmond, 66, avenue Max Dormoy, 94500 Champigny sur Marne, France

Filed May 13, 1986, Ser. No. 862,879
Claims priority, application France, May 14, 1985, 85 07293
Int. Cl.[4] H01H *73/00, 73/12, 75/00, 83/06*
U.S. Cl. 335—18 **9 Claims**

1. An electricity power supply circuit including a trip switch, said circuit comprising at least:

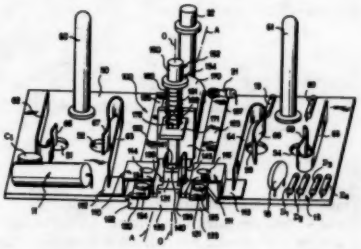
a fixed electrical contact;

a movable electrical contact facing said fixed electrical contact and urged away therefrom by a resilient member;

a control member movable between a working position in which said control member brings the moving electrical contact to bear against the fixed electrical contact, and a rest position in which said electrical contacts are separated, by virtue of said resilient member;

a cocking lever movable between a locking position and an unlocking position;

an elongate holding spring fixed to said control member and including at least one main arm which extends substantially parallel to the direction of cocking lever displacement, with said holding spring being fixed to said control



member by said at least one main arm, and an auxiliary arm which extends transversly to the direction of cocking lever displacement and which is engaged in a notch in said cocking lever when the cocking lever is moved to its locked position to hold the control member in its working position, the holding spring being relatively rigid in the direction of cocking lever displacement while being relatively flexible perpendicularly to the direction of cocking lever displacement;

resilient bias means suitable for urging the cocking lever towards its unlocked position;

an electrical winding; and

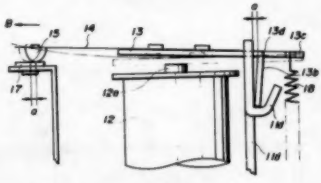
a magnetic body displacable by said winding to disengage said holding spring from said cocking lever.

4,701,734

HINGE TYPE RELAY

Sadao Nakano, Yokohama, and Shigeru Inaba, Zama, both of Japan, assignors to Niles Parts Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1986, Ser. No. 844,880
Int. Cl.[4] H01H *67/02*
U.S. Cl. 335—128 **25 Claims**



1. A hinge type relay comprising:

a yoke having a yoke portion and a fulcrum portion connected to said yoke portion,

an armature having a support portion and a rocking portion connected to and angled relative to said support portion,

said fulcrum portion supporting said rocking portion for rocking motion thereon,

a flexible member secured at one end to said support portion and having a contact member at another end,

an electromagnetic coil positioned for magnetically attracting said support portion theretowards and

a fixed contact positoned so that said contact member contacts it when said support portion is magnetically attracted towards said coil and said rocking portion rocks on said fulcrum portion, and said flexible member bending

and said contact member sliding on said fixed contact as said support portion is drawn closer to said coil.

4,701,735

BOBBINS FOR ELECTRICAL COILS AND METHOD OF MANUFACTURING ELECTRICAL COILS THEREFROM

John Hill, Cincinnati, Ohio; Royston W. Bannister, and Henry Turczanski, both of Kent, England, assignors to Standex Electronics (U.K.) Limited, Kent, England

Filed Dec. 11, 1986, Ser. No. 940,608
Int. Cl.[4] H01F 5/00
U.S. Cl. 335—282 12 Claims

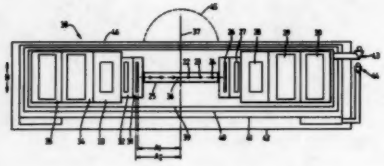
1. An electrical coil comprising:
a symmetrical high-strength plastic bobbin;
first and second lips integrally formed at ends of said bobbin;
first and second spaced apart flanges integrally formed on said bobbin inwardly of said first and second lips, respectively, said first and second spaced apart flanges defining therebetween a main coil winding space, and said first and second lips and corresponding ones of said first and second spaced apart flanges defining therebetween first and second terminal winding spaces, respectively;
a main coil having a predetermined number of turns of electrical wire around said main coil winding space; and
first and second terminal connections having a predetermined number of turns of said electrical wire around each of said first and second terminal winding spaces, said turns being completely soldered together to provide a unitary circumferential band for terminal connection.

4,701,736

MAGNET ASSEMBLY HAVING A PLURALITY OF NESTED COAXIAL COILS

Ian L. McDougall, and John M. Bird, both of Oxford, England, assignors to Oxford Magnet Technology Limited, London, England

Filed Feb. 1, 1985, Ser. No. 697,322
Claims priority, application United Kingdom, Apr. 30, 1984, 8410972
Int. Cl.[4] H01F 5/00
U.S. Cl. 335—299 10 Claims



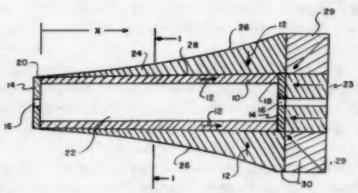
1. A magnet assembly comprising a plurality of nested, coaxial coils each having a plurality of turns defining radii, whereby working currents are adapted to flow in opposite directions through at least two of said coils, said plurality of turns of said coils and said radii being adapted such that when working currents flow through said coils a substantially uniform magnetic field is generated in a homogeneous region.

4,701,737

LEAKAGE-FREE, LINEARLY VARYING AXIAL PERMANENT MAGNET FIELD SOURCE

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 30, 1986, Ser. No. 868,863
Int. Cl.[4] H01F 7/00
U.S. Cl. 335—301 9 Claims



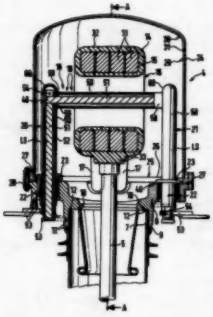
1. A magnetic circuit having low magnetic leakage comprising:
means for generating a longitudinally linearly increasing magnetic field; and
means for shielding said generating means preventing magnetic flux leakage therefrom;
said generating means comprising a frustum shaped first permanent magnet having a concentric cylindrical axial bore extending therethrough and a magnetization in the axial direction;
said shielding means comprising a cladding permanent magnet surrounding said first magnet, and having a generally radial magnetization transverse to the axial magnetization of said first magnet, and having a non-linear outer exterior surface with the greatest radial width of said cladding magnet adjacent the greatest radial width of said first magnet.

4,701,738

HIGH-VOLTAGE CURRENT TRANSFORMER

Norbert Preissinger, Litzendorf, and Teofil Bogdan, Bamberg, both of Fed. Rep. of Germany, assignors to MWB Messwandler-Bau AG, Bamberg, Fed. Rep. of Germany

Filed Nov. 12, 1986, Ser. No. 929,513
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1985, 3540547; Mar. 13, 1986, 3608391
Int. Cl.[4] H01F 27/04, 40/06
U.S. Cl. 336—92 32 Claims



1. High-voltage current transformer of a head design with a column made of insulating material which supports a head housing mounted thereon, and an insulating medium in said head housing; said converter comprising:
an essentially horizontal sealing plate mounted at the upper end of the column and upon which plate is mounted the head housing

a secondary system mounted in said head housing including a central opening and secondary leads extending through the sealing plate and column of insulating material;

a primary lead having an approximately U-shape;

a horizontal base of said U-shape passing through the central opening of secondary system and at least one of two legs of the U-shape pøssing downwardly through the sealing plate in an insulating-medium-tight fashion to outside the area delimited by insulating column, and is directly electrically contactable from below said sealing plate;

the other of the two legs being mounted to sealing plate, and is electrically contactable from below said sealing plate; and

the head housing includes a hood completely enclosing said primary lead and said secondary system from above and being fastened in an insulating-medium-tight fashion to said sealing plate.

4,701,739

EXHAUST GAS SENSOR AND PROCESS FOR PRODUCING SAME

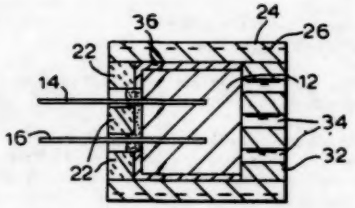
Kazuko Sasaki, Minoo, Japan, assignor to Figaro Engineering Inc., Osaka, Japan

Filed Mar. 13, 1985, Ser. No. 711,154

Claims priority, application Japan, Mar. 30, 1984, 59-63900; Mar. 30, 1984, 59-63901

Int. Cl.⁴ H01L *7/00*

U.S. Cl. 338—34 **13 Claims**



1. An exhaust gas sensor including a gas sensitive member comprising a metallic oxide semiconductor capable of undergoing variations in resistance, and at least one pair of electrodes connected to the gas sensitive member, the exhaust gas sensor being characterized in that the metallic oxide semiconductor is a compound $ASnO_{3-\delta}$ wherein A is at least one element selected from the group consisting of Ba, Sr, Ca and Ra, and δ is a non-stoichiometric parameter.

4,701,740

RHEOSTATIC DEVICES

Oswald Reuss, Unterelsbach, and Franz Rutterschmidt, Heustreu, both of Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt/Saale, Fed. Rep. of Germany

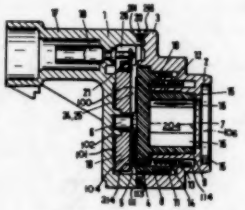
Filed Nov. 27, 1985, Ser. No. 802,721

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3444229

Int. Cl.⁴ H01C *10/32*

U.S. Cl. 338—164 **20 Claims**

1. A rheostatic device comprising a housing bottom part with a cupped recess, a resistor member with two contact members positioned in said recess, a collector member with a third contact member positioned in said recess, a cupped lid having a ring-shaped outer circumferential wall configured for mating with said housing bottom part and enclosing said recess, a rotor positioned in said recess between said bottom part and said lid, a pivot bearing in the bottom of said recess, a shaft extending from one side of said rotor and received in said pivot bearing, a projection extending from an opposing side of said rotor to said lid for rotatably supporting said rotor about an axis of rotation, a central opening in said lid for exposing said rotor for actuation from outside the device and a sliding spring contact supported by said rotor for providing an electrical connection between said resistor member and said collector member and characterized in that said projection comprises: at least two projecting, hollow, cylindrical rotor walls with different diameters concentrically arranged around said axis of



rotation of the rotor and providing a ring-shaped space therebetween; and said lid further comprises: at least two hollow, cylindrical lid walls concentrically disposed with respect to one another on an inner side of said lid and extending from said inner side of the lid into said space between said pair of rotor walls.

4,701,741

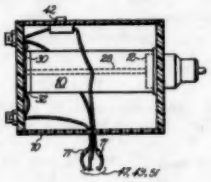
TEMPERATURE SENSING SYSTEM FOR AUTOMATIC TRANSMISSIONS

Wesley J. Bert, 3919 Dearborn Ave., Sarasota, Fla. 33581

Filed Jan. 31, 1985, Ser. No. 696,921

Int. Cl.⁴ B60Q *1/00*; **H01R** *13/00*; **G08B** *17/06*

U.S. Cl. 340—57 **4 Claims**



1. A temperature sensing system for installation in an automobile without the need for modification of the automobile, the automobile having a source of electric power and an automatic transmission with a dip stick tube and associated dip stick which extends into the automatic transmission fluid reservoir, said system comprising:

temperature sensing means independent of the dip stick sized to permit insertion into the automatic transmission reservoir through the dip stick tube;

said temperature sensing means having a first temperature responsive switch set to close at a first preset temperature;

said temperature sensing means encased in a liquid tight housing;

first insulated conductor means connected to said temperature sensing means in said liquid tight housing for extending through the dip stick tube;

annunciator means for announcing in response to the closing of said first temperature responsive switch that the automatic transmission fluid has reached said first preset temperature;

said annunciator means including a console having a cigar lighter receptacle compatible plug means telescopically mounted therein for making a connection to the automobile source of electrical power; and

second insulated conductor means for connecting said an-

nunciator means to said cigar ligher receptacle compatible plug means and to said first insulated conductor means.

4,701,742

PNEUMATIC PRESSURE SWITCH FOR TIRE PRESSURE MONITOR

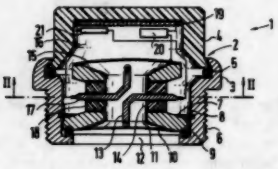
Volker Ruehr, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 3, 1986, Ser. No. 835,380

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1985, 3507253

Int. Cl.[4] B60C *23/00*

U.S. Cl. 340—58 29 Claims



25. A pneumatically operated pressure switch for monitoring the air pressure in a tire including a housing means pneumatically communicating with a filling medium of said tire, said housing mans including a reference pressure chamber filled with gas and sealed off from said filling medium, wherein said pressure switch further includes: pressure detecting means for detecting a reference gas pressure in said reference pressure chamber and indicating means for indicating when said reference gas pressure deviates from a predetermined valve, irrespective of the monitored tire air pressure.

4,701,743

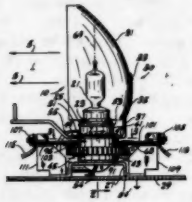
SIGNAL APPARATUS

Barry Pearlman, Chesterfield, and W. Kenneth Menke, Glendale, both of Mo., assignors to Public Safety Equipment, Inc., St. Louis, Mo.

Filed Aug. 16, 1984, Ser. No. 641,399

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—84 32 Claims



1. Signal apparatus comprising:

means for producing a signal beam;

means for sweeping the beam in at least one zone of rotation; and

means for controlling the sweeping means to cause it to sweep the signal beam in periodically reversed motion at a substantially constant angular velocity across the zone of rotation between preselected endpoints thereof wherein said controlling means includes means for detecting when the sweeping means has reached either of the endpoints of the zone of rotation and means responsive to the detecting means for reversing the sweeping means when an endpoint is detected.

4,701,744

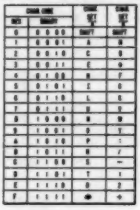
METHOD AND APPARATUS FOR COMPACTING AND DE-COMPACTING TEXT CHARACTERS

Warren C. DeVilbiss, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 27, 1986, Ser. No. 844,837

Int. Cl.[4] H03M *7/30*

U.S. Cl. 340—347 DD 8 Claims



1. A method of compacting characters for storage, comprising:

generating a sequence of four-bit characters in which some characters are of a first character set and other characters are taken from a second character set;

inserting a given four-bit shift character not taken from either character set in said sequence of characters every time a character of either set is followed by a character of the other set; and

storing said sequence of characters and said shift character in a memory means in which each memory address represents at least one pair of stored characters, each character of said at least one pair being selected from said first character set said second character set and said given shift character.

4,701,745

DATA COMPRESSION SYSTEM

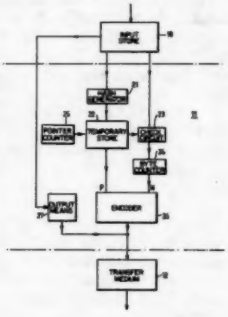
John R. Waterworth, Cheadle, England, assignor to Ferranti, plc, Cheshire, England

Filed Mar. 3, 1986, Ser. No. 835,793

Claims priority, application United Kingdom, Mar. 6, 1985, 8505790

Int. Cl.[4] H03M *7/30*

U.S. Cl. 340—347 DD 8 Claims



1. A data compression system comprising an input store for

receiving and storing a plurality of bytes of uncompressed data from an outside source, and data processing means for processing successive bytes of data from the input store;

the data processing means including circuit means operable to check whether a sequence of successive bytes to be processed identical with a sequence of bytes already processed, and including hash generating means responsive to the application of a predetermined number of bytes in sequence to derive a hash code appropriate to those bytes, a temporary store in which the hash code may represent the address of a storage location, and a pointer counter operable to store in the temporary store at said address a pointer indicative of the position in the input store of one of the predetermined number of bytes;

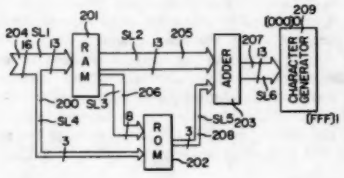
output means operable to apply to a transfer medium each byte of data not forming part of such an identical sequence; and

encoding means responsive to the identification of such a sequence to apply to the transfer medium an identification signal which identifies both the location in the input store of the previous occurrence of the sequence of bytes and the number of bytes contained in the sequence.

4,701,746
DEVICE FOR CONVERTING CODE SIGNALS OF ONE BIT NUMBER INTO A CODE SIGNAL OF A SMALLER BIT NUMBER

Sigei Ueda, Kamifukuoka; Kozo Matsumoto, Tokyo; Kiyoshi Kanaiwa, Kawasaki, and Muneo Adachi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 358,535, Mar. 16, 1982, abandoned. This application Sep. 5, 1985, Ser. No. 772,201
Claims priority, application Japan, Mar. 24, 1981, 56-41645
Int. Cl.[4] G11B *20/18*
U.S. Cl. 340—347 DD **14 Claims**



1. A device for converting m-bit information signals into n-bit code signals, where n is smaller than m, the device comprising:

input means for inputting m-bit information signals;

first output means, which treats an m-bit information signal received from said input means as being in one of a plurality of groups comprising predetermined numbers of information signals, for choosing one of said groups using the input m-bit information signal and for generating a first order signal indicating the number, serially among all the groups of m-bit information signals, of the chosen group of information signals and a first identification signal indicating the locations of particular information signals in the chosen group of information signals;

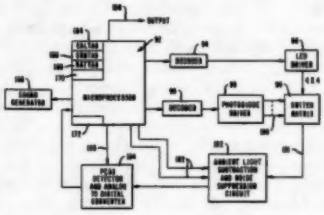
second output means for generating, in response to the first identification signal and a second identification signal derived from the input m-bit information signal, a second order signal indicating the number, serially among the particular information signals in the chosen group of information signals, of the input m-bit information signal; and

obtaining means for obtaining an n-bit code signal, corresponding to the input m-bit information signal, by using the first order signal and the second order signal.

4,701,747
DATA INPUT SYSTEM INCLUDING A KEYBOARD HAVING NO MOVING PARTS

Jonathan M. Isherwood, and Andrew R. Gibbs, both of Leamington Spa, Great Britain, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 23, 1985, Ser. No. 812,425
Claims priority, application United Kingdom, Apr. 16, 1985, 8509688
Int. Cl.[4] H03K *17/969*
U.S. Cl. 340—365 P **6 Claims**



1. A data entry system comprising:

a sheet-like keyboard member of laminated construction of chemically toughened glass having an inner surface and an outer surface, said outer surface having a plurality of key areas respectively representative of different keys;

an array of light-emitting devices positioned adjacent said inner surface and arranged to emit light for transmission through said sheet-like member, each light-emitting device being positioned opposite a respective key area, said light-emitting devices being arranged to emit infra-red light, said light-emitting devices being mounted in individual optical support means made of a material which is opaque to infra-red light, and being arranged to emit light in a direction generally perpendicular to said inner and outer surfaces of said sheet-like member;

a plurality of light-responsive devices respectively associated with said light-emitting devices, each light-responsive device being arranged to receive light emitted by its associated light-emitting device and reflected from said sheet-like member and from an operator's finger placed in juxtaposition with the respective key area, each light-responsive device being mounted in paired relation in proximity to its corresponding light-emitting device on one of said optical support means, said optical support means being mounted on a printed circuit board which provides electrical connections to said light-emitting devices and said light-responsive devices, also including securing means for holding said printed circuit board in fixed relation with said sheet-like member;

means for successively energizing said light-emitting devices in each of a succession of scan cycles;

means for successively energizing said light-responsive devices in each scan cycle, each light-responsive device being arranged to be energized prior to the energization of the associated light emitting device;

circuit means for producing a succession of output signals in response to the energization of said light-emitting devices, each said output signal being representative of that part of the output of the respective light-responsive device due to light emitted by the associated light-emitting device and reflected back to the light-responsive device, said circuit means including an ambient light subtraction circuit to the input of which the outputs of said light-responsive devices are arranged to be applied, said light subtraction circuit including capacitor means arranged to acquire a charge during each interval between the energization of a light-responsive device and the energization of the associated

light-emitting device, this charge being representative of the output of the respective light-responsive device due to ambient light, and switch means arranged to connect said input to an output portion of said light subtraction circuit via said capacitor means during each period of energization of a light-emitting device, whereby there is applied to said output portion a voltage pulse whose magnitude is dependent on the component of the output of the associated light-responsive device due to light emitted by the respective light-emitting device and reflectcd back to the associated light-responsive device; and

data processing means responsive to said output signals for producing an output indicative of a key operated by an operator's finger being placed in juxtaposition with the respective key area, said data processing means being arranged to store calibration data representative of the said output signal of each light-responsive device in the absence of an operator's finger being placed in proximity with the respective key area, and in which, in operation, said data processing means is arranged to generate in each scan cycle data ratios each representative of the value of said output signal of a respective light-responsive device to the respective calibration data for that device, said data processing means being arranged to produce an output indicative of an operated key on the basis of an evaluation of said data ratios.

4,701,748

KEY CIRCUIT

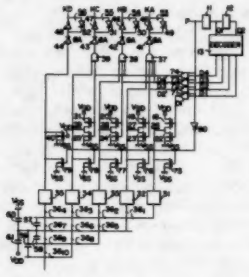
Hiroshi Ushiki, Yokohama, and Tetsuaki Iwasaki, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Tosbac Computer System Co., Ltd., Tokyo, both of, Japan

Filed Sep. 26, 1986, Ser. No. 911,894

Claims priority, application Japan, Sep. 30, 1985, 60-216700

Int. Cl.[4] G06F *3/02, 1/04*

U.S. Cl. 340—365 S **6 Claims**



1. A key circuit comprising:

a plurality of external terminals;

a plurality of key switches inserted between each of different pairs of said external terminals;

a logic circuit including decoder means for generating a plurality of time-division signals on the basis of a reference pulse signal, and inverted logic product means for stopping the generation of said time-division signals during a blanking period with a predetermined time duration;

a plurality of buffer circuits for outputting signals supplied to the plurality of said external terminals;

a detection circuit for detecting the closed key switches of the plurality of said key switches on the basis of said time-division signal and signals derived from the external terminals for key signal inputting; and

a plurality of switch means inserted between each of the plurality of said external terminals and a reference potential, said switch means being conductive during said blanking period.

4,701,749

ELECTROACOUSTIC CALLING DEVICE WITH UNIVERSAL BEARING SUPPORTING A SOUND APERTURE CLOSURE MEMBER

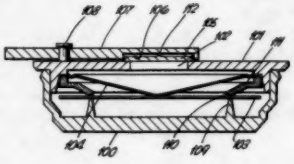
Harold E. Barnes, Didmarton Nr Badminton, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 9, 1985, Ser. No. 806,731

Claims priority, application United Kingdom, Dec. 19, 1984, 8432013

Int. Cl.[4] G10K *1/36, 9/12*

U.S. Cl. 340—384 R **6 Claims**



1. In an electroacoustic calling device comprising an electroacoustic transducer mounted in a housing, said housing having at least one aperture in a wall thereof through which sound waves may be emitted from the housing, said device further comprising a closure member located in a recess in an arm which is pivotally mounted on the housing, whereby rotation of said arm about its pivot causes a surface of the closure member to move across an exterior surface of the wall of said housing to at least partially cover said aperture, said surface of the closure member and said exterior surface of the housing wall in the region of the aperture being complementary, the improvement characterized in that: said surface of the closure member is urged against said exterior surface of the housing wall by means of a universal bearing which, when the closure member is moved to cover the aperture, causes the surface of the closure member to align with said exterior surface of the housing wall and thereby minimize leakage of sound waves between such surfaces; said universal bearing being located between the closure member and the bottom of the recess in said arm and providing universally rotatable contact therebetween.

4,701,750

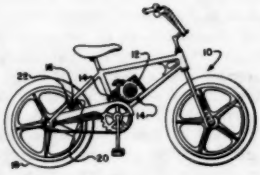
MOTORCYCLE SOUND SIMULATOR FOR NON-MOTORIZED VEHICLE

James P. Wilkinson, Richfield, and Thomas R. Halverson, Duluth, both of Minn., assignors to Audio Science Investors Limited Partnership, Duluth, Minn.

Filed Aug. 6, 1984, Ser. No. 638,112

Int. Cl.[4] G08B *3/00*

U.S. Cl. 340—384 E **10 Claims**



1. A motorcycle simulator for use on a non-motorized vehicle, comprising:

(a) means for producing an electrical signal proportional to

the velocity of the non-motorized vehicle;

(b) means for determining the acceleration of the vehicle from said signal;

(c) means for producing an audio output corresponding generally to the sound of a motorcycle at the particular velocities;

(d) means for providing step-wise continuous changes in said audio output frequency, said changes occurring at particular velocities and accelerations and producing an audio characteristic corresponding to shifting of gears on a motorcycle; and

(e) a starting sequence which randomly determines whether attempted starting of the simulator will produce an audio output corresponding to a rising frequency and then back to an idle frequency corresponding to a start condition or alternatively an increasing frequency followed by a decreasing frequency to zero corresponding to a non-start condition.

4,701,751

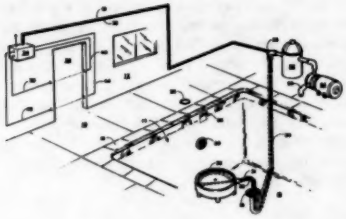
POOL ALARM SYSTEM

Robert L. Sackett, 2282 #43 Caminito Pescado, San Diego, Calif. 92107

Division of Ser. No. 669,896, Nov. 9, 1984, Pat. No. 4,620,181. This application Aug. 8, 1986, Ser. No. 894,899

Int. Cl.[4] G08B *13/18*

U.S. Cl. 340—556 **3 Claims**



1. An alarm system for detecting persons having a height less then a pre-determined height passing through an opening comprising.

first and second light sources;

first, second, third and forth optic transmission means;

switching means;

logic means; and

alarm means,

said first light source is transmitted through said first optic transmission means to a first elevation in said opening, said second optic transmission means receives said first light source from said first optic transmission means across said opening and transmits said first light source to said logic means, said second light source is transmitted through said third optic transmission means to a second elevation in said opening lower in height then said first elevation, said fourth optic transmission means receives said second light source from said third optic transmission means across said opening and transmits said second light source to said logic means, said logic means operates said switching means which activates said alarm only when only the second light source across said opening is interrupted.

4,701,752

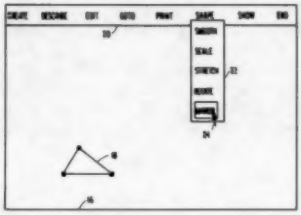
MIRROR INVERSE FUNCTION IN AN INTERACTIVE GRAPHICS SYSTEM

John S. Wang, Travis County, Tex., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 24, 1985, Ser. No. 790,888

Int. Cl.[4] G09G *1/06*

U.S. Cl. 340—723 **3 Claims**



1. A method of generating a mirror image of a graphic object on an interactive computer graphics display comprising the steps of:

selecting an object on said display and selecting a mirror edit function for the selected object on said display;

generating a mirror image of the selected object and simultaneously displaying both the generated mirror image and the selected object on said display; and

displaying a mirror control object in a window on said display, said mirror control object having a mirror direction handle and a mirror angle handle which may be selected and rotated to simultaneously manipulate the generated mirror image and the selected object on said display, wherein the manipulation of the generated mirror image and the selected object comprise the steps of:

rotating the generated mirror image and the selected object in the plane of the display as a function of the manipulation of the mirror direction handle; and

simultaneously stretching or shrinking the generated mirror image and the selected object on the display as a function of the manipulation of the mirror angle handle.

4,701,753

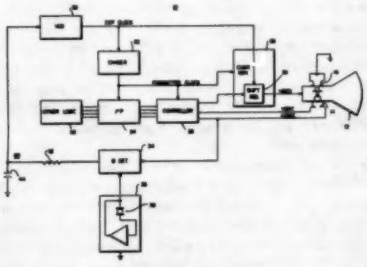
VIDEO DISPLAY TERMINAL WITH MULTI FREQUENCY DOT CLOCK

Arthur N. Borg, Lake Forest, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 1, 1985, Ser. No. 782,640

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—731 **4 Claims**



1. A video display terminal comprising:

a VCO for generating a dot clock signal;

means for dividing the dot clock signal for developing a character clock signal;

a microprocessor driven controller for supplying vertical and horizontal deflection signals to a CRT and video control data to a character generator, the deflection signals being derived by dividing the character clock signal by one of at least two different divide ratios, corresponding, respectively, to display formats of different numbers of characters per line;

a crystal controlled reference source; and

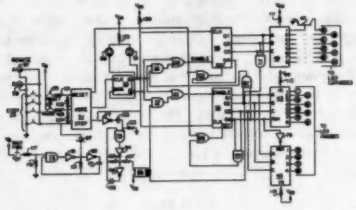
phase detector means comparing signal inputs from the reference source and the controller and, in response to a change in said different divide ratios, developing and coupling an error signal to the VCO for changing the frequency of the dot clock signal so as to maintain the frequency of the deflection signals at a constant value.

4,701,754

INDICATOR DEVICE FOR SUBSTANCE RECEIVING WELLS IN A MICROTITER PLATE

Richard B. Provonchee, Camden, Me., assignor to FMC Corporation, Philadelphia, Pa.

Filed Apr. 18, 1985, Ser. No. 724,392
Int. Cl.[4] G08B 5/22
U.S. Cl. 340—815.03 **7 Claims**



1. A well indicating device, for use with a microtiter plate that contains a plurality of substance-receiving wells, which comprises

(i) a housing, having a top wall;

(ii) an indicator display board, on the housing top wall, that contains light-emitting diodes for use in identifying individual wells in a transparent or translucent microtiter plate use in conjunction with the device;

(iii) an alignment means on the housing top wall, for positioning the microtiter plate with respect to the light emitting diodes on the indicator display board, so that individual wells in the microtiter plate may be identified and illuminated via light transmitted from a light-emitting diode through the bottom of an individual well in the microtiter plate;

(iv) a control means connected to or located in the housing, including a power switch adapted to be connected to an electric power source for energizing the device and an event swtich for operating the light-emitting diodes; and

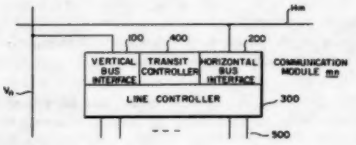
(v) an electronic circuit in the housing actuated by the event switch for operating the light-emitting diodes one at a time in a predetermined sequece, to individually identify each substance-receiving well of the microtiter plate which is the subject of manipulation.

4,701,755

DATA SWITCHING SYSTEM

Masatsugu Nakagawa, and Tatsuya Iwano, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 7, 1985, Ser. No. 731,352
Claims priority, application Japan, May 11, 1984, 59-94027
Int. Cl.[4] H04Q 9/00
U.S. Cl. 340—825.02 **2 Claims**



1. A data switching system comprising:

transmission means including a plurality of horizontal buses and a plurality of vertical buses, both buses being arrayed logically in a lattice form; and

a plurality of data communication modules, each of which is connected to one of said horizontal buses and one of said vertical buses at a cross point of said lattice-like array, for accommodating a plurality of data lines for controlling communications between said data lines and said horizontal or vertical bus, between said horizontal bus and said vertical bus and between said data lines themselves, wherein each data communication module includes:

a vertical bus interface for interfacing with a corresponding vertical bus;

a horizontal bus interface for interfacing with a corresponding horizontal bus;

a line controller having a plurality of communication interfaces for accommodating said data lines; and

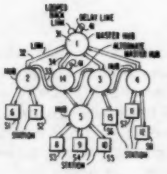
a transit controller having a controller for controlling direct memory access from said vertical bus and said horizontal bus, a central processor for controlling this entire data communication module, and an interrupt controller for arbitrating among interruptions from said vertical bus interface, said horizontal bus interface, said controller, said central processor and said line control controller.

4,701,756

FAULT-TOLERANT HIERARCHICAL NETWORK

William E. Burr, 14520 Gallant Fox La., Darnestown, Md. 20878

Filed Sep. 10, 1985, Ser. No. 774,493
Int. Cl.[4] H04Q 9/00
U.S. Cl. 340—825.02 **7 Claims**



1. In a hierarchical broadcast network having a master hub, a plurality of child hubs, primary communication link means from each said child hub to said master hub, respectively, and a plurality of stations and secondary communication link means from each child hub to one or more stations, respectively, the improvement comprising,

circuit means for rendering said network fault tolerant, including,

an alternate master hub,

further primary communication link means connecting said alternate master hub to said master hub,

first redundant communication link means connecting said alternate master hub to at least one of said child hubs, and

second redundant communication link means connecting the remaining ones of said child hubs to each other serially.

4,701,757

CONTROL SYSTEM FOR PRINTING MACHINES

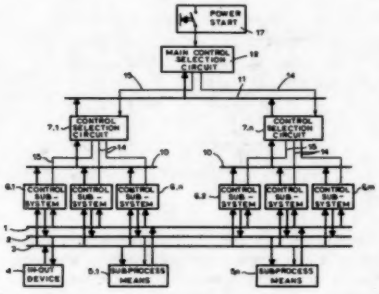
Helmut Schuck, Coswig; Karl-Heinz Foerster, Dresden; Monika Kuehn, Meissen, and Klaus Schanze, Coswig, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Feb. 27, 1986, Ser. No. 835,258

Claims priority, application German Democratic Rep., Feb. 27, 1985, 273587

Int. Cl.[4] H04Q *9/00*; G05B *23/02*

U.S. Cl. 340—825.06 **10 Claims**



1. In a control system for printing machines for controlling a plurality of subprocess means (5) and a plurality of modes of operation, including an input device (4) and a start device (17), the improvement comprising an input data bus (1) and an output data bus (2) connected to said subprocess means; a keyboard data bus (3), a plurality of control subsystems (6) arranged in groups, each control subsystems being connected via said input data bush and output data bus to said subprocess means and via said keyboard data bus to said input device; first control code buses (16); second control code buses (11); a plurality of control selection circuits arranged in groups and each assigned to a group of said control subsystems, each group of said control subsystems being connected via a respective first control code bus, and each group of said control selection circuits being connected directly via a second control code bus or indirectly via further groups of further control selection circuits and further control code buses at an input side with a main control selection circuit (12) connected to said start device; and preferential conduits (15) and actuation conduits (14), said main control selection circuit with preferential conduits being connected via at least one control selection circuit with one control subsystem of one group while remaining control subsystems with actuation conduits are connected via at least one control selection system to said main control selection system.

4,701,758

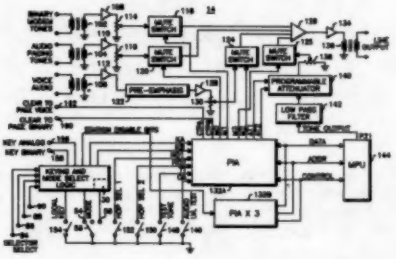
INDIVIDUAL SIMULCAST TRANSMITTER REMOTE CONTROL SYSTEM ENCODER

Stephen H. Dunkerton, Riverwoods; Gary D. Erickson, Mt. Prospect, both of Ill., and Gary R. Reynolds, Twin Falls, Id., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 5, 1983, Ser. No. 520,778

Int. Cl.[4] H04Q *7/00*; H04B *7/00*

U.S. Cl. 340—825.48 **10 Claims**



1. A simulcast transmitter remote control encoder which cooperates with analog or binary paging terminals wherein the paging terminal produces voice and encoded analog or binary paging information, said encoder for transmitting a sequence of a plurality of control tones over an existing paging communication link for the purpose of selectively activating and deactivating specific transmitters in a simulcast system, said encoder comprising:

first input means for receiving encoded analog or binary paging signals from a paging terminal;

second input means for inputting sector information which indicates specific simulcast transmitters to be deactivated;

means coupled to said second input means for generating a sequence of a plurality of control tones in response to said sector information comprising a high level guard tone,

a plurality of groups of function tones based on user programmed information,

a plurality of keying sequence tones which mark the end of each group of function tones, and

an end of sequence tone to mark the end of said sequence of a plurality of control tones combining means coupled to said first input means and said generating means for selectively combining said sequence of a plurality of control tones and said encoded paging signals; and

outputting means coupled to said combining means for outputting the combined sequence of a plurality of control tones and encoded paging signals.

4,701,759

CALL REMINDER FOR A RADIO PAGING DEVICE

Mark Nadir, Ft. Lauderdale, and John D. Hauck, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 596,322, Apr. 3, 1984, abandoned. This application Sep. 16, 1986, Ser. No. 909,064

Int. Cl.[4] G08B *3/00*

U.S. Cl. 340—825.44 **2 Claims**

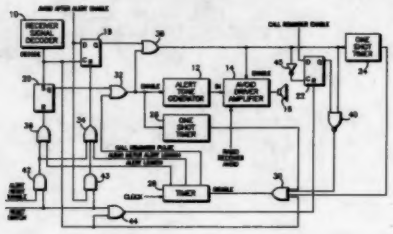
1. A receiver of the type which generates an alerting signal to apprise a user that said receiver has been addressed, comprising:

receiver-decoder means for receiving an encoded address signal, decoding said encoded address signal and detecting if said receiver has been addressed;

initial alert signal generating means, coupled to said receiver-decoder means, for generating a periodic initial alert signal when the address of said receiver is detected, said

initial alert signal being generated during a first period of time and

reminder audio alert signal generating means, coupled to said receiver-decoder means, for generating a periodic



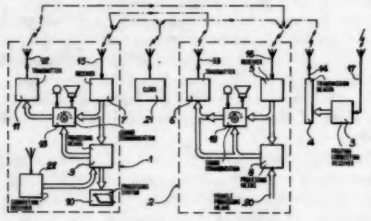
reminder audio alert signal commencing when a predetermined amount of time has elapsed after the cessation of said initial alert signal, said remidner alert signal being periodic at a different rate than said initial alert signal.

4,701,760

METHOD FOR POSITIONING MOVING VEHICLES AND EXCHANGING COMMUNICATIONS BETWEEN THE VEHICLES AND A CENTRAL STATION

Daniel Raoux, Bonnelles, France, assignor to Commissariat a l'Energie Atomique, France

Filed Mar. 5, 1985, Ser. No. 708,259
Claims priority, application France, Mar. 7, 1984, 84 03539
Int. Cl.[4] G01S *1/02*
U.S. Cl. 340—993 **4 Claims**



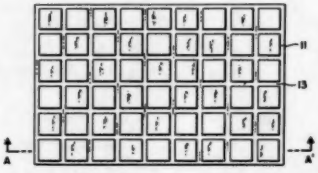
1. A method for monitoring the movements of vehicles from a central transmission-reception and processing station, comprising marking the real coordinates of each vehicle in latitude and longitude, as well as the times at which each vehicle occupies these coordinates, said real coordinates being obtained by an automatic correction of approximate coordinates of the vehicles, these real coordinates being supplied by processing means carried by each vehicle, for receiving and processing position finding signals transmitted by stations of the world omega network, vehicle-carried transmission means being capable of transmitting to the central station signals corresponding to the real coordinates, the automatic correction of the coordinates being carried out on the basis of signals supplied by correction receivers, the correction receivers being located in the vicinity of fixed radio navigation transmission beacons occupying fixed positions with known latitude and longitude coordinates, the correction receiver in the vicinity of each beacon receiving the signals transmitted by stations of the world omega network and processing these signals in order to calculate the differences between the real phases and the approximate phases of the world omega network signals received at said known fixed positions of the beacons, these differences being transmitted in the form of coded correction signals, on a carrier wave transmitted by each beacon, to the reception means carried by each vehicle, the vehicle-carried transmission means transmitting to the central station the real coordinate signals of the vehicle reception means and processing means of the central station supplying the real coordinates of the vehicles upon the reception of the signals from the transmission means of the vehicles, wherein the time corresponding to each vehicle position is supplied by a high-precision, transmitting clock, intercepted by the vehicle-carried reception means, said clock synchronizing the transmission and reception means carried by the vehicles, the vehicle-carried transmission means transmitting sequences of interleaved signals for the different vehicles, further comprising the step of transmitting coded signals indicating a vehicle identification number to the central station using a transmission - reception means carried by each vehicle, wherein coordinate corrections are carried out in the central station, which also incorporates a coordinate correction receiver for carrying out said corrections in the case of a failure of the correction receiver located in the vicinity of a beacon, an alarm being provided to indicate said failure.

4,701,761

MEANS FOR SUPPRESSING REFLECTION OF ELECTROMAGNETIC RADIATION

John Affinito, San Diego, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Filed May 30, 1985, Ser. No. 739,548
Int. Cl.[4] H01Q *17/00*
U.S. Cl. 342—1 **9 Claims**



1. A composite for covering a structure whereby to suppress reflection of electromagnetic radiation from said structure comprising a sheet or film having deposited on at least one surface thereof, by sputtering, alternating layers of a ferrite and of a member selected from the group consisting of ferrites other than the first said ferrite and magnetic metals whereby to form a composite having a high dielectric constant with a high magnetic permeability, the layered product being in the form of stacks of platelets, the planes of metal platelets being separated by planes of relatively magnetic ferrite, with the stack edges being separated by a relatively narrow air gap, the said planes being parallel to each other, the thickness of the platelets being substantially less than the electromagnetic skin depth of the platelets, and the length in the other dimensions of the platelets being substantially less than the wavelength of a predetermined electromagnetic radiation.

4,701,762

THREE-DIMENSIONAL ELECTROMAGNETIC SURVEILLANCE SYSTEM AND METHOD

John T. Apostolos, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 17, 1985, Ser. No. 788,291
Int. Cl.[4] G01S *5/02*; G06F *15/332*
U.S. Cl. 342—417 **4 Claims**

1. For use with an array of antenna elements that generate element signals in the presence of radio waves, a system for determining direction and frequency of the radio waves, comprising:

A. a Fourier-transformation device, including an input port associated with each antenna element and adapted for

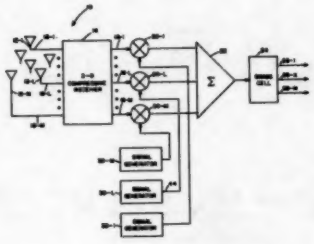
reception of the element signal therefrom, for performing a temporal Fourier transformation on the element signals to generate a plurality of transform signals in which the time at which a transform-signal component occurs indicates the temporal frequency of the element-signal component that gives rise to it;

B. a plurality of oscillators generating a like plurality of oscillator outputs, respectively;

C. means for storing modulation data to respectively modulate each transform signal, the modulation data, for each transform signal, being associated with each of a plurality of predetermined directions, each direction being associated with a respective oscillator and termporal frequency, the result of modulating each transform signal with the modulation data being to effect a coherent summation for each external source;

D. a modulator-translator circuit associated with each transform signal, each modulator-translator circuit being connected to receive the transform signal associated therewith and including:

i. a plurality of preliminary modulators, associated with respective ones of the oscillators and connected to receive the outputs of their associated oscillators, for fetching from the waveform-storage circuit the modulation data associated with the directions associated with the associated oscillators and with the temporal frequency of the element-signal components giving rise to



the currently occurring transform-signal components, and for modulating the oscillator outputs in accordance with the fetched modulation data associated with the directions associated therewith to generate, for each of the directions, a preliminary-modulator signal associated with the associated transform signal;

ii. a preliminary summation circuit, connected to receive all of the preliminary-modulator signals generated from the associated transform signal, for adding them together to generate a preliminary summation signal associated with the associated transform signal; and

iii. a main modulator, connected to receive the associated transform signal and the preliminary summation signal associated therewith, for modulating the associated transform signal with the preliminary summation signal to generate a main-modulator signal associated with that transform signal;

E. a main summation circuit, connected to receive the main-modulator signals associated with all of the transform signals, for adding them together to produce a main summation signal; and

F. a frequency-segregation circuit connected to receive the main summation signal and generate therefrom a segregated output in which the segregated-output components generated from different oscillators are separated from each other to indicated the directions of the sources of the element signals that give rise to the segregated output.

4,701,763

SMALL ANTENNA

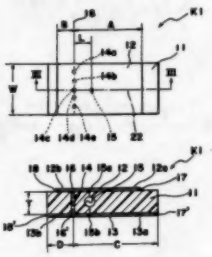
Junko Yamamoto, Okayama; Kyohei Fujimoto; Kazuhiro Hirasawa, both of Niihari, and Haruhiro Kuboyama, Tsuchiura, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 16, 1985, Ser. No. 776,529

Claims priority, application Japan, Sep. 17, 1984, 59-194232

Int. Cl.[4] H01Q *1/38, 1/48*

U.S. Cl. 343—700 MS **13 Claims**



11. A wireless apparatus comprising a casing, a circuit portion mounted in said casing, and a small antenna, said small antenna comprising:

a double-sided printed circuit board which has opposite conductive faces;

a plurality of conductive reactance post members which are, respectively, provided at a plurality of first positions of said dielectric plate so as to extend between said upper and lower conductive plates such that said upper and lower conductive plates are connected, at their positions corresponding to said first positions, to each other by said reactance post members;

said reactance post members dividing said upper and lower conductive plates into a first upper conductive portion and a second upper conductive portion and into a first lower conductive portion and a second lower conductive portion, respectively such that first and second plane-parallel plate transmission lines separated from each other by said reactance post members are, respectively, formed by said first upper conductive portion and said first lower conductive portion and by said second upper conductive portion and said second lower conductive portion;

a feed point which is provided at a second position of said dielectric plate for subjecting said upper and lower conductive plates, at their positions corresponding to said second position, to power feed from said feed point;

said small antenna being mounted in said casing of said wireless apparatus; and

a feeder connected between said feed point and said circuit portion of said wireless apparatus.

4,701,764

MINIATURE HIGH-GAIN ANTENNA

Jean-Claude Malcombe, Saint-Agnant, France, assignor to Societe de Maintenance Electronique "SOMELEC", Paris, France

Filed Jan. 23, 1986, Ser. No. 821,787

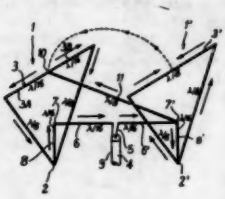
Claims priority, application France, Jan. 28, 1985, 85 01262

Int. Cl.[4] H01Q *11/12*

U.S. Cl. 343—742 **8 Claims**

1. A high-gain antenna adapted for transmission and reception and adapted to be connected to a coaxial cable having a central conductor and a conductive sheath, said antenna being adapted for operation at a wavelength λ and comprising two loops disposed in substantially parallel planes the distance

between which is $\lambda/8 \pm 20\%$ and at least one connecting element connecting said loops having a length substantially equal to the distance between them, each of said loops being adapted



to be connected to a respective conductor of said coaxial cable and said loops being selected from a closed loop with an approximate length of $3\lambda/8$ and or open loop with a length of $\lambda/4$.

4,701,765

STRUCTURE FOR A DICHROIC ANTENNA

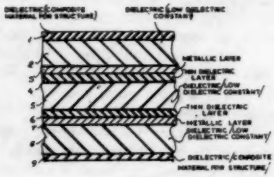
Carlo Arduini; Renato Barboni; Antonio Castellani; Ugo Ponzi, all of Rome; Paolo Bielli, Corio, and Salvatore Contu, Pecetto Torinese, all of Italy, assignors to Cselt-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Oct. 24, 1985, Ser. No. 790,859

Claims priority, application Italy, Nov. 8, 1984, 68112 A/84

Int. Cl.[4] H01Q *19/95, 19/18*

U.S. Cl. 343—897 **4 Claims**



1. A double reflecting antenna for use aboard satellites with a dichroic subreflector for a radiation, said radiation having first and second components, said first and said second components having at least one parameter selected from a group consisting of frequency and polarization said subreflector for reflecting said first of said components and transparent to said second of said components having a series of layers comprising:

a first dielectric layer with high mechanical resistance;

a second dielectric layer with low dielectric constant;

a first grid for reflecting said first of said components and transparent to said second of said components;

a third dielectric layer supporting said first grid;

a fourth dielectric layer with low dielectric constant;

a fifth dielectric layer with high mechanical resistance;

a second grid; and

a sixth dielectric layer for supporting said second grid.

4,701,766

METHOD OF MAKING AN INK JET HEAD INVOLVING IN-SITU FORMATION OF AN ORIFICE PLATE

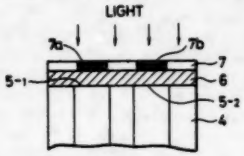
Hiroshi Sugitani, Machida; Masakazu Ozawa; Hiroto Matsuda, both of Yokohama; Masami Ikeda, Chiba, and Haruyuki Matsumoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

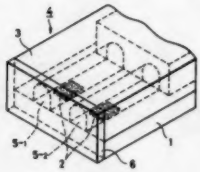
Continuation of Ser. No. 557,342, Dec. 1, 1983, abandoned, which is a continuation of Ser. No. 383,099, May 28, 1982, Pat. No. 4,450,455. This application May 5, 1986, Ser. No. 859,230

Claims priority, application Japan, Jun. 18, 1981, 94881; Jun. 18, 1981, 94882

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—1.1 **5 Claims**





1. A method of making an ink jet head having an orifice plate with an orifice extending therethrough to define a flow path for the ejection of ink, comprising the steps of:

providing an ink jet head body having a liquid passageway for the ink with an outlet;

adhering one surface of a photosensitive plate to the ink jet head body to cover the outlet;

aligning a pattern mask with the liquid passageway and exposing the other surface of the photosensitive plate to radiation through the pattern mask after the photosensitive plate is adhered to the ink jet body; and

forming the orifice through the photosensitive plate in the direction of the thickness thereof and in communication with the liquid passageway by removing portions of the photosensitive plate in accordance with the pattern of radiation to which the photosensitive plate was exposed through the mask.

4,701,767

MAGNETIC RECORDING HEAD AND METHOD FOR MANUFACTURING

Motomasa Imai, Tokyo; Mitsuo Harata, Kawasaki; Takashi Takahashi, Tokyo, and Kazuo Nishijima, Hadano, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 5, 1986, Ser. No. 870,898

Claims priority, application Japan, Jun. 28, 1985, 60-142140

Int. Cl.[4] G01D *15/12*

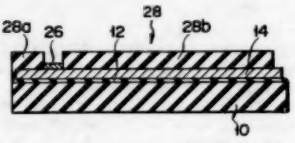
U.S. Cl. 346—74.2 **8 Claims**

1. A method for manufacturing a recording head adapted to be moved relative to a recording medium, which is comprised of a conductive substrate and dielectric layer formed on the conductive substrate, to permit data to be recorded on the

recording medium with the use of a conductive/magnetic toner on the recording medium, which comprises the steps of:

attaching a conductive/magnetic sheet to an insulating substrate of a first size with an adhesive layer therebetween, said insulating substrate having the first size greater than a second size thereof defined by that insulating substrate of a finally completed recording head;

selectively etching said conductive/magnetic sheet to form a plurality of slits at a predetermined interval, both ends of said slits being located beyond a side edge of said finally completed recording head, remaining portions of said conductive/magnetic sheet being electrically connected each other;



electroplating said conductive/magnetic sheet at one side edge portion thereof receding from the corresponding side of said finally completed recording head to form a plated layer for a bonding pad, said one side edge portion of said conductive/magnetic sheet intersecting one end portion of the slits, the other side edge portion of the conductive/magnetic sheet being used as a common electrode in the electroplating step; and

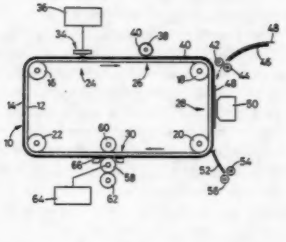
removing those areas of said conductive/magnetic sheet, said plated layer and said insulating substrate, which are located beyond the side edge of the insulating substrate of said finally completed recording head, to form a parallel array of conductive/magnetic electrodes and a bonding pad on said one side edge portion of said electrodes.

4,701,768

THERMO-MAGNETIC RECORDING DEVICE

Ryohei Komiya, Nagoya, and Masaaki Terazawa, Ichinomiya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 7, 1986, Ser. No. 928,033
Claims priority, application Japan, Nov. 11, 1985, 60-252496
Int. Cl.[4] G01D *15/12*
U.S. Cl. 346—74.4 **6 Claims**



1. A thermo-magnetic recording device wherein a magnetized latent image is produced on a magnetic layer which is initialized through unidirectional magnetization thereof, by means of locally heating the magnetic layer, said recording device comprising:

a heat generating roller for heating a local portion of said magnetic layer, through contact of an outer surface of said roller with said local portion of said magnetic layer; and

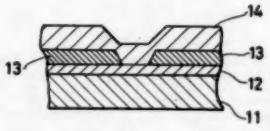
a magnetic-field generating device for generating, at said local portion of said magnetic layer, a magnetic field which has the same N-S direction as that of said unidirectional magnetization, and thereby initializing the magnetic layer.

4,701,769

THERMAL HEAD AND METHOD FOR FABRICATION THEREOF

Yasuo Nishiguchi; Keijirou Minami, and Masakazu Hoda, all of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Aug. 14, 1985, Ser. No. 765,851
Claims priority, application Japan, Aug. 17, 1984, 59-172304
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **7 Claims**



1. A thermal head for thermal recording, which comprises a heat-generating resistor formed on a substrate and an electric conductor for supplying electric power to the heat-generating resistor, wherein the heat-generating resistor is composed of a dense thin layer having a composition represented by the following formula:

$$Ti_xSi_yO_z$$

wherein x is a number of from 0.25 to 0.45, y is a number of from 0.25 to 0.40 and z is a number of from 0.25 to 0.40, with the proviso that the sum of x, y and z is equal to 1.

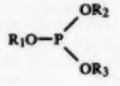
4,701,770

SUBSTRATE FOR AN OPTICAL DISC

Akio Ito, Katano; Hideaki Mochizuki, Higashiosaka; Masaaki Sunohara, Hirakata, and Tooru Tamura, Ikeda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 12, 1986, Ser. No. 873,405
Claims priority, application Japan, Jun. 14, 1985, 60-130142; Jun. 14, 1985, 60-130143
Int. Cl.[4] G01D *9/00, 15/10*; G03C *1/495, 1/76*
U.S. Cl. 346—135.1 **1 Claim**

1. An optical disc which comprises an optical disc substrate of bis(hydroxyphenyl)alkane polycarbonate resin and a recording film formed thereon, said polycarbonate resin having an average molecular weight of 13000 to 22000 and containing 0 to 0.0025 wt % of phosphite ester represented by the following structural formula:

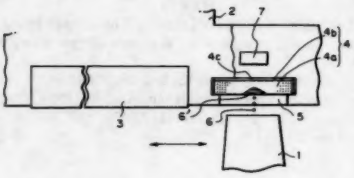


where R_1 and R_2 are alkyl groups or aryl groups, and R_3 is a hydrogen atom, alkyl group, or aryl group.

4,701,771
INK JET RECORDER HAVING AN INK ACCEPTOR WITH AN INK ABSORBER PROVIDED THEREIN

Kunihiko Ikeda, Kodaira, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,507
Claims priority, application Japan, Jul. 30, 1984, 59-159920
Int. Cl.[4] G01D *18/00*
U.S. Cl. 346—140 R 32 Claims

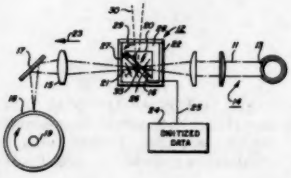


1. An ink jet recorder comprising:
an ink jet head having at least one orifice for emitting ink, a portion of which is not required for printing and constitutes waste ink;
ink acceptor means having a disposable ink absorber arranged to face said ink jet head for accepting waste ink discharged from the orifice of said ink jet head; and
detection means for detecting a degree of absorption ability of said ink absorber and for providing a signal indicating when the absorber should be replaced.

4,701,772
THERMALLY ACTIVATED IMAGE BAR

Robert W. Anderson, Fairport, and Michael Poleshuk, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1986, Ser. No. 935,653
Int. Cl.[4] G01D *15/14*
U.S. Cl. 346—160 15 Claims

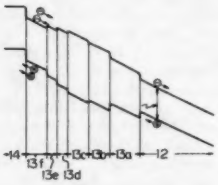


1. A thermally activated image bar for use in an electrophotographic printer to form latent electrostatic images on a photoconductive member of the printer one line of pixels at a time, comprising:
at least one transparent prism having a flat surface;
a transparent member having an index of refraction similar to that of the prism and having at least one flat surface;
means to maintain the prism and the member in fixed relationship to each other, so that their respective surfaces confront and are spaced parallel with each other to form a uniformly thick gap therebetween;
a liquid medium hermetically sealed between the confronting surfaces of the prism and member, the liquid medium having an index of refraction substantially matched to that of the prism and the member;
an optical shield being formed on the prism surface having at least one aperture therein for the passage of light therethrough;
a linear array of transparent heating elements and associated addressing electrodes therefor being formed on the member flat surface, the heating elements being aligned with said at least one aperture;
means to direct a sheet of light to the photoconductive member through the image bar, so that the sheet of light passes through the prism, optical shield aperture, and the liquid medium in the gap before it strikes the array of heating elements and exits from the member; and
means for selectively applying current pulses to the heating elements in response to digitized data signals to form momentary vapor bubbles in the liquid medium, the bubbles providing an index of refraction different from the liquid medium, thereby modulating portions of the sheet of light passing therethrough by the mechanism of total internal reflection.

4,701,773
SEMICONDUCTOR DEVICE FOR RECEIVING LIGHT

Takao Kaneda, and Kazuo Nakajima, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 821,884, Jan. 27, 1986, abandoned, which is a continuation of Ser. No. 549,430, Nov. 7, 1983, abandoned. This application Aug. 25, 1986, Ser. No. 900,249
Claims priority, application Japan, Nov. 8, 1982, 57-195519
Int. Cl.[4] H01L *29/90*
U.S. Cl. 357—13 6 Claims



1. A semiconductor device for receiving light, comprising:
a first semiconductor layer having a first conductivity type and having a first forbidden bandwidth, electron-hole pairs being generated by said first semiconductor layer;
a second semiconductor layer having the first conductivity type, formed on said first semiconductor layer, having a second forbidden bandwidth greater than said first forbidden bandwidth of said first semiconductor layer and distributed so that said second forbidden bandwidth has a maximum value at an intermediate position in the thickness direction of said second semiconductor layer; and
a third semiconductor layer having a second conductivity type opposite the first conductivity type, formed on said second semiconductor layer, having a forbidden bandwidth smaller than that of the region between said third semiconductor layer and said second semiconductor layer and larger than that of said first semiconductor layer, said third semiconductor layer receiving the light incident thereon, holes being injected into the region between said second semiconductor layer, where said second forbidden bandwidth has a maximum value, and said third semiconductor layer so as to reduce multiplication noise.

4,701,774
LIGHT EMITTING SEMICONDUCTOR DEVICE

Paul W. A. McIlroy, Tokyo; Atsushi Kurobe, Kawasaki, and Hideto Furuyama, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

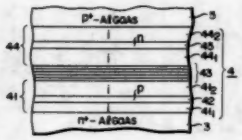
Filed Dec. 18, 1985, Ser. No. 810,093
Claims priority, application Japan, Oct. 15, 1985, 60-229466
Int. Cl.[4] H01L *33/00*
U.S. Cl. 357—17 12 Claims

1. A light emitting semiconductor device comprising:

a multilayered semiconductor body in which an active region having at least one quantum well is formed;

an n-type semiconductor layer, disposed adjacent to one side of said multilayered semiconductor body, for injecting electrons into said active region;

a p-type semiconductor layer, disposed adjacent to the other side of said multilayered semiconductor body, for injecting holes into said active region;



at least one p-type impurity doped layer formed in said multilayered semiconductor body, disposed between said n-type semiconductor layer and said active region; and

at least one n-type impurity doped layer formed in said multilayered semiconductor body, disposed between said p-type semiconductor layer and said active region.

4,701,775

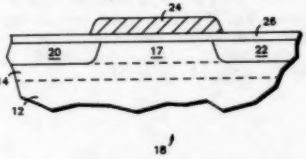
BURIED N⁻ CHANNEL IMPLANT FOR NMOS TRANSISTORS

Stephen J. Cosentino, Austin, Tex.; James M. Rugg, Tempe, Ariz., and Richard W. Mauntel, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 21, 1985, Ser. No. 789,573

Int. Cl.⁴ H01L *29/78, 27/02*

U.S. Cl. 357—23.12 **14 Claims**



1. An n-channel MOS device in a p acceptor doped region of a semiconductor substrate surface made by the process comprising the steps of:

forming a deep layer containing n donors within the surface of the semiconductor substrate including within the p acceptor doped region, but not containing enough n donors to fully compensate the p acceptor doped region;

forming a thin gate oxide layer on top of the surface of the semiconductor substrate;

patterning and forming a gate on the thin gate oxide layer; and

forming heavily-doped n^+ donor source/drain regions within the surface of the semiconductor substrate adjacent the gate, having junctions with the p acceptor doped region.

4,701,776

MOS FLOATING GATE MEMORY CELL AND PROCESS FOR FABRICATING SAME

Gust Perlegos, Freemont, and Tsung-Ching Wu, San Jose, both of Calif., assignors to Seeq Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 527,213, Aug. 29, 1983, abandoned. This application Dec. 1, 1986, Ser. No. 936,965

Int. Cl.⁴ H01L *27/10, 29/78;* **G11C** *11/40*

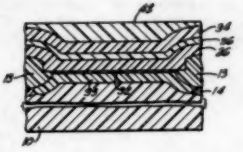
U.S. Cl. 357—23.5 **1 Claim**

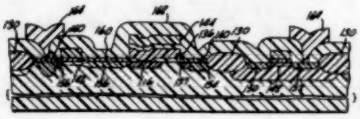
1. An electrically programmable, electrically erasable MOS memory device for use in a memory array having a plurality of memory cells arranged on a substrate of a first conductivity type, said substrate having at least one well structure of a second conductivity type formed therein to a first predetermined depth in a region other than the substrate region which supports said plurality of memory cells, said memory device comprising:

spaced apart first and second doped regions of a second conductivity type in said substrate, the substrate area between said first and second doped regions serving to establish a channel for said memory device;

field stop regions in said substrate having edges defining the sides of said channel for said memory device and for separating each of said memory cells from others of said memory cells in said array;

a third doped region of said second conductivity type in said substrate formed to a depth less than said first predetermined depth of said well structure in order to provide a





source of charge carriers, a portion of said third region extending from said first doped region into said substrate area between said first and second doped regions to define the length of said channel, another portion of said third doped region extending appreciably under the edges of said field stop regions which define the sides of said channel;

an electrically isolated first conductive gate disposed above said substrate between said first and second doped regions;

a first insulating layer separating said first conductive gate from said channel in said substrate, said first insulating layer including a section formed over said third doped region to permit the passage of charge carriers between said third doped region and said first conductive gate, said section having a thickness which is less than the thickness of the remainder of said first insulating layer; and

a second conductive gate disposed above and insulated from said first conductive gate.

4,701,777

GATE ARRAY TYPE SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yoshihisa Takayama, Kawasaki; Shigeru Fujii, and Tomoaki Tanabe, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 653,536, Sep. 24, 1984, abandoned. This application Dec. 30, 1986, Ser. No. 948,406

Claims priority, application Japan, Sep. 30, 1983, 58-182069

Int. Cl.⁴ H01L *27/02, 27/10, 27/15;* **G11C** *5/02*

U.S. Cl. 357—42 **2 Claims**

1. A gate array type semiconductor integrated circuit formed in a semiconductor substrate having a first conductivity type and having wells formed therein, the wells having a second conductivity type different than the first conductivity

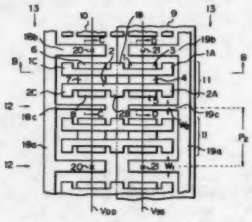
type, said device including first and second power lines extending in a column direction and comprising:

basic cell arrays, each extending in the column direction and arranged in a row direction with column spaces extending in the column direction and located between adjacent basic cell arrays, each basic cell array including basic cells arranged in the column direction with row spaces located between adjacent basic cells in each of said basic cell arrays, each of the basic cells having a first-channel MIS transistor formed in the semiconductor substrate and a second-channel MIS transistor formed in one of the wells;

first diffusion regions of the first conductivity type, formed only in the semiconductor substrate adjacent the first-channel MIS transistor in each of the basic cells, each of said first diffusion regions having a comb-shaped structure including:

a first base part extending in the column direction along a first side of a corresponding basic cell array in one of the column spaces; and

first tooth parts forming an integral structure with said first base part, each of said row spaces in the corresponding basic cell array having one of said first tooth



parts formed therein, said first tooth parts crossing underneath the first power line and including first narrow and first wide tooth parts, formed in narrow and wide row spaces, respectively, said first wide tooth parts including first ohmic contacts connected to the first power line; and

second diffusion regions of the second conductivity type, formed only in the wells adjacent the second-channel MIS transistor in each of the basic cells, each of said second diffusion regions corresponding to one of said basic cell arrays and having a comb-shaped structure including:

a second base part extending in the column direction along a second side, opposite the first side, of the corresponding basic cell array in one of the column spaces; and

second tooth parts forming an integral structure with said second base part, each of said row spaces in the corresponding basic cell array having one of said second tooth parts formed therein, said second tooth parts crossing underneath the second power line and including second narrow and second wide tooth parts, formed in narrow and wide row spaces, respectively, said second wide tooth parts including second ohmic contacts connected to the second power line.

4,701,778

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING OVERLAPPING CIRCUIT CELLS AND METHOD FOR DESIGNING CIRCUIT PATTERN THEREFOR

Nobuhiko Ancha, Kawasaki, and Shigenori Baba, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

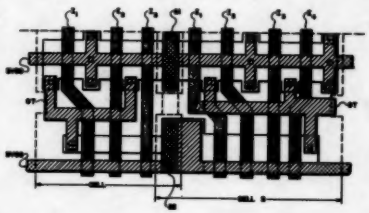
Filed Jun. 25, 1985, Ser. No. 748,599

Claims priority, application Japan, Jun. 29, 1984, 59-135410

Int. Cl.⁴ H01L *27/10, 23/50*

U.S. Cl. 357—45 **3 Claims**

1. A semiconductor integrated circuit having a standard cell configuration, comprising at least two kinds of circuit cells disposed in a row, each of said at least two kinds of circuit cells having a bulk pattern including a predetermined set of circuit elements which are interconnected to form a circuit having a respective one of at least two kinds of logic functions, and wirings for supplying first and second power source voltages, said bulk pattern including a pair of regions on one side of said each circuit cell, said pair of regions being respectively connected to said wirings for suplying the first and second power



source voltages, said pair of regions of said bulk pattern of one of said circuit cells of one kind overlapping said pair of regions of said bulk pattern of an adjoining one of said circuit cells of a different kind, said pair of regions of said bulk pattern of another one of said circuit cells being exclusively used by said another circuit cell without overlapping said pair of regions of said bulk pattern of any other of said circuit cells.

4,701,779

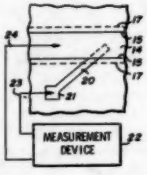
ISOLATION DIFFUSION PROCESS MONITOR

Robert A. Pease, San Francisco, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 5, 1984, Ser. No. 668,595

Int. Cl.⁴ H01L *27/04*

U.S. Cl. 357—48 **4 Claims**



1. In a PN junction isolated monolithic integrated circuit wherein an isolation diffusion is extended through an epitaxial layer desposited upon an opposite conductivity type substrate, said isolation diffusion having a lateral surface diffusion component as well as a diffusion component extending normal to the surface which acts to provide the desired isolation, a monitor resistor for evaluating the extent of said lateral surface diffusion comprising:

means for electrically contacting said isolation diffusion;

resistor contact means spaced apart from said isolation diffusion and having the same conductivity type as said isolation diffusion; and

a resistor pattern having the same conductivity type as said isolation diffusion and extending between said resistor contact and said isolation diffusion whereby said resistor value is related to the lateral surface diffusion of said isolation diffusion.

4,701,780

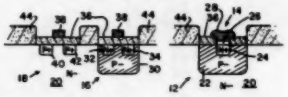
INTEGRATED VERTICLE NPN AND VERTICAL OXIDE FUSE PROGRAMMABLE MEMORY CELL

Kevin T. Hankins; Mark W. Michael; Jay D. Moser, all of Palm Bay, Fla., and Brian K. Rosier, Jenkintown, Pa., assignors to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 711,816, Mar. 14, 1985, Pat. No. 4,635,345. This application Dec. 5, 1986, Ser. No. 903,200

Int. Cl.[4] H01L *27/02, 29/34, 29/04, 27/12*

U.S. Cl. 357—51 8 Claims



1. An integrated circuit comprising:

a substrate;

a first insulative layer on said substrate of a first thickness;

at least one bipolar transistor in said substrate having a collector and base region and formed or to be formed emitter region;

a second insulative layer of a second thickness less than said first thickness on said substrate over said bipolar transistor;

a third insulative layer of a third thickness less than said second thickness on said subtrate over said formed or to be formed emitter region and having an area substantially equal to the lateral area of said formed or to be formed emitter region;

a top electrode on said third insulative layer;

said third insulative layer forms a vertical fuse between said top electrode and said bipolar transistor.

4,701,781

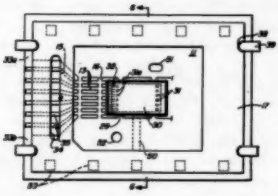
PRE-TESTABLE SEMICONDUCTOR DIE PACKAGE

Thanomsak Sankhagowit, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 5, 1984, Ser. No. 628,106

Int. Cl.[4] H01L *23/48, 29/44;* H05K *5/06*

U.S. Cl. 357—70 10 Claims



1. A pre-testable lead-frame assembly comprising:

a conductive foil substrate having multiple interconnected finger contacts extending from a die-receiving area, said finger contacts having inner ends bonded to contact pads on a die placed in said area, exposed outer ends forming test probe sites and intermediate portions extending between said inner and said outer ends;

said intermediate portions including cross links interconnecting adjacent finger contacts for stabilizing the position of said fingers prior to die bonding and acting to create dam bars useful in controlling the plastic flow in an encapsulation operation;

an insulative encapsulant surrounding said die and the inner ends of said finger contacts to form a package from which said intermediate portions extend to form package pins;

an insulative support carrier spaced from and surrounding said package and extending at least transversely of and bonded to said finger contacts to temporarily support said exposed outer ends for test purposes, said cross links being exposed between said support carrier and said package so that they can be removed after said die is encapsulated to form discrete insulated testable finger contacts extending from said die to said outer ends.

4,701,782

METHOD OF AUTOMATIC FOCUSSING BY DIGITAL ANALYSIS OF THE CONTOURS OF AN IMAGE

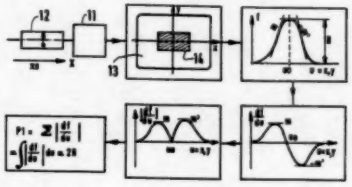
Jean-Louis Duvent, Les Ulis, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1986, Ser. No. 846,649

Claims priority, application France, Apr. 5, 1985, 85 05264

Int. Cl.[4] H04N *5/232*

U.S. Cl. 358—227 22 Claims



1. A method of automatically focusing an image onto a video pickup device, said method comprising the steps of:

arranging an objective in front of the pickup device to direct radiation onto the pickup device;

generating a contour signal representing the intensity of the radiation on the pickup device as a function of the position on the pickup device;

generating a first derivative signal representing the derivative of the contour signal with respect to position along a line on the pickup device;

generating an absolute value signal representing the absolute value of the first derivative signal;

generating a quality parameter representing the integral of the absolute value signal with respect to position; and

controlling the position of the objective so as to maximize the quality parameter.

4,701,783

TECHNIQUE FOR ENCODING AND DECODING VIDEO WITH IMPROVED SEPARATION OF CHROMINANCE AND LUMINANCE

William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Continuation of Ser. No. 579,482, Apr. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 483,126, Apr. 8, 1983, Pat. No. 4,628,344, which is a continuation-in-part of Ser. No. 418,055, Sep. 14, 1982, Pat. No. 4,517,597. This application Jan. 20, 1987, Ser. No. 5,296

Int. Cl.[4] H04N *11/14*

U.S. Cl. 358—12 31 Claims

1. Apparatus for encoding and decoding a video signal, representative of an image, comprising:

(A) an encoder, including:

means responsive to said video signal for deriving a low frequency luminance signal;

means for generating a combined chrominance and detail luminance signal by combining a chrominance signal derived from the video signal and an unmodulated detail luminance signal derived from the video signal, the combined signals having frequency spectrums which overlap;

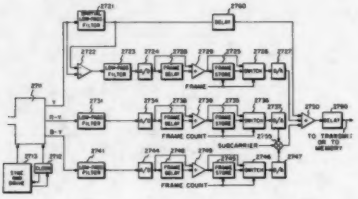
means for producing output frames of said low frequency luminance signal at a fast frame refresh rate;

means for producing output frames of said combined chrominance and detail luminance signal at a slow frame refresh rate, including means for generating frames of detail luminance signal which repeat once each, and means for generating frames of chrominance signal which repeat once each, but with a phase-reversed carrier during the repeat frames; and

(B) a decoder, including:

means responsive to said frames of combined chrominance and detail luminance signal at said slow frame refresh rate for separating said combined signals and producing separated chrominance and detail luminance signals at said fast frame refresh rate; and

means responsive to the low frequency luminance signal



and the separated detail luminance signal for generating a composite luminance signal.

27. For use in a system which receives a high resolution video signal, a method for producing an improved luminance signal, comprising the steps of:

deriving from said high resolution video signal a low frequency luminance signal in a first frequency range by low pass filtering the luminance component of said high resolution video signal in both the vertical and horizontal directions;

deriving from said high resolution video signal a detail luminance signal in a second frequency range that is above said first frequency range but below the high frequency end of said high resolution video signal; and

combining said low frequency luminance signal and said detail luminance signal to obtain an improved standard resolution luminance signal.

4,701,784

PIXEL DEFECT CORRECTION APPARATUS

Hiroki Matsuoka, Takatsuki; Atsushi Morimura, Nara, and Yoshinori Kitamura, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP85/00300, § 371 Date Jan. 31, 1986, § 102(e) Date Jan. 31, 1986, PCT Pub. No. WO85/05752, PCT Pub. Date Dec. 19, 1985

PCT Filed May 30, 1985, Ser. No. 829,135

Claims priority, application Japan, Jun. 1, 1984, 59-113337; Dec. 17, 1984, 59-265749

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.17 **12 Claims**

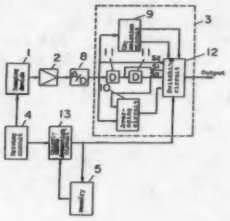
1. A defect correction apparatus, comprising:

a memory including information indicative of an image failure of a solid state imaging device;

means for correcting a signal of a failure pixel based on said information indicative of image failure, by using the signals of pixels therearound, by producing plural different signals, said plural different signals being indicative of plural pixels which are around said failure pixel;

means for selecting only one signal from said plural different signals; and

means for substituting said one signal for said failure pixel signal at the position of said failure pixel, wherein said selecting of only one signal from plural different signals is



made by utilizing a largeness relation among said plural different signals.

4,701,785

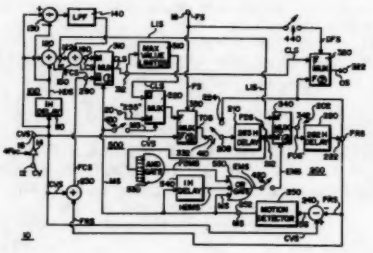
FRAME COMB FILTER HAVING FREEZE FRAME FEATURE

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 27, 1986, Ser. No. 923,547

Int. Cl.[4] H04N *9/78*

U.S. Cl. 358—31 **13 Claims**



12. A Y/C separation apparatus for a television receiver having a freeze frame mode comprising;

a source of an incoming composite video signal CVS;

frame store means coupled to said video signal source for delaying said incoming composite video signal CVS by one frame period to produce a frame delayed composite video signal FRS;

means for combining the incoming composite video signal with the frame delayed composite video signal to provide a frame combed video signal FCS;

means for storing said frame combed video signal FCS in said frame store means during said freeze frame mode for generating a still picture.

4,701,786

PEDESTAL CONTROL CIRCUIT

Junichi Yamanaka, Sagamihara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 14, 1986, Ser. No. 839,566

Claims priority, application Japan, Mar. 30, 1985, 60-47696[U]

Int. Cl.[4] H04N *9/69, 9/72*

U.S. Cl. 358—32 **11 Claims**

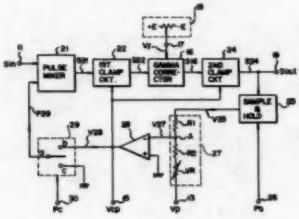
1. A pedestal control circuit comprising:

pedestal mixing means for mixing a reference pedestal signal with an input video signal which has not been gamma-corrected, and for producing a mixed video signal;

gamma correcting means for gamma correcting the mixed video signal in accordance with a predetermined variable gamma correction characteristic, and for producing a gamma-corrected output video signal;

pedestal detecting means for detecting from the gamma-corrected output video signal a component corresponding to the reference pedestal signal, and for producing a pedestal detection signal; and

pedestal feedback means, responsive to the pedestal detection signal and a predetermined pedestal control signal, for feeding the reference pedestal signal, having a magnitude corresponding to the pedestal detection signal, back to said pedestal mixing means so that the pedestal detection signal converges to a value corresponding to the predetermined pedestal control signal;



wherein said gamma correcting means includes:

a first clamp circuit for performing DC clamping of the mixed video signal from said pedestal mixing means in accordance with a predetermined clamping control signal, and for producing a first DC restored signal;

a gamma correction circuit for performing gamma correction of the first DC restored signal in accordance with the predetermined variable gamma correction characteristic, and for producing a gamma-corrected signal; and

a second clamp circuit for performing DC clamping of the gamma-corrected signal from said gamma correction circuit in accordance with the predetermined clamping control signal, and for producing a second DC restored signal corresponding to the gamma-corrected output video signal.

4,701,787

SELECTIVELY ENABLED IMAGE SIGNAL PROCESSING CIRCUIT USING RECURSIVE FILTERING

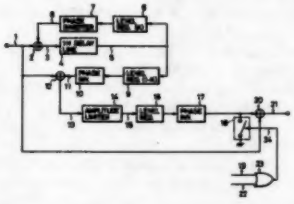
Naohisa Fujiwara, Kyoto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,909

Claims priority, application Japan, Jan. 28, 1985, 60-13829; Jan. 28, 1985, 60-16212

Int. Cl.[4] H04N *9/64, 5/213*

U.S. Cl. 358—36 **11 Claims**



1. An image signal processing circuit device comprising: a delay circuit for delaying an input signal by a time corresponding to one horizontal scanning period, a first level regulator for multiplying an output signal of said delay circuit by a factor K to regulate an amount of feedback, where K is smaller than unity, a first adder for summing said video signal and an output signal of said first level regulator, said first adder having an output connected to an input terminal of said delay circuit, a second level regulator for multiplying said output signal of said delay circuit by a factor (1-K), a first phase inverter for inverting a phase of an output signal of said second level regulator, a second adder for summing said video signal and an output signal of said first phase inverter, an amplitude limiter for limiting an amplitude of an output signal of said second adder, a third level regulator for regulating an output signal of said amplitude limiter to a noise level of said video signal, a second phase inverter for inverting a phase of an output of said third level regulator, and a third adder for summing said video signal and an output signal of said second phase inverter, said third level regulator, said second phase inverter, and said third adder constituting an operation circuit.

4,701,788

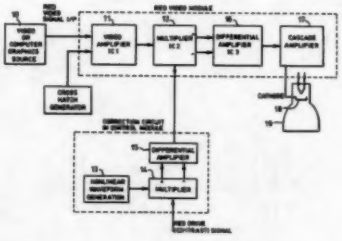
COLOR TEMPERATURE CORRECTION OF COLOR VIDEO PROJECTORS

Francois G. Desjardins, Maryhill, Canada, assignor to Electrohome Limited, Ontario, Canada

Filed Jan. 29, 1986, Ser. No. 823,677

Int. Cl.[4] H04N *9/31, 9/73*

U.S. Cl. 358—64 **3 Claims**



1. In combination with a colour video projector for projecting an image on a screen and of a type employing red, green and blue cathode ray tubes for projecting red, green and blue light respectively, dichroic mirrors and a final single lens through which the red, green and blue light is projected on said screen and which is characterized by non-uniform colour temperature across the width of the screen of the image projected thereon, the non-uniform colour temperature specifically being as a result of a substantially linear decrease in green light intensity between about the centerline of said screen and one edge thereof, said centerline being one-half way between said one edge of said screen and the edge thereof opposite to said one edge, a substantially linear decrease in blue light intensity between about said centerline of said screen and said opposite edge of said screen to said one edge thereof and a substantially linear increase in red light intensity between said opposite edge of said screen and a location part way between said opposite edge of said screen and said centerline of said screen, apparatus for improving the uniformity of said colour temperature across the width of said screen, said apparatus comprising: means for deriving red, green and blue contrast signals respectively; non-linear waveform generating means for deriving red, green and blue correction signals respectively, said red correction signal being of a type that will increase said red light intensity between said location and said opposite edge of said screen to compensate at least partially for the inherent decrease in said red light intensity between said location and said opposite edge of said screen, said green correction signal being of a type that will increase said green light

intensity between about said centerline of said screen and said one edge of said screen to compensate at least partially for the inherent decrease in green light intensity between about said centerline of said screen and said one edge of said screen, and said blue correction signal being of a type that will increase said blue light intensity between about said centerline of said screen and said opposite edge thereof to compensate at least partially for the inherent decrease in blue light intensity between about said centerline of said screen and said opposite edge of said screen; multiplying means for multiplying said red contrast and said red correction signals, said green contrast and said green correction signals and said blue contrast and said blue correction signals to provide separate red, green and blue colour correction modulated red, green and blue contrast signals; means for deriving red, green and blue video signals; multiplying means for multiplying said red video signal and said red colour correction modulated red contrast signal, said green video signal and said green colour correction modulated green constrast signal and said blue video signal and said blue colour correction modulated blue contrast signal; and means for supplying the signals from the last-mentioned multiplying means to drive said red, green and blue cathode ray tubes respectively.

4,701,789

CATHODE RAY TUBE

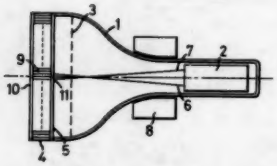
Gordon R. Bonye, Kent, England, assignor to Rank Electronic Tubes Limited, England

Filed Mar. 11, 1986, Ser. No. 838,371

Claims priority, application United Kingdom, Mar. 13, 1985, 8506547; Mar. 29, 1985, 8508318

Int. Cl.[4] H04N *9/18, 9/20*

U.S. Cl. 358—65 **14 Claims**



1. A colour cathode ray tube comprising:

an evacuated envelope having a faceplate comprised by a multiplicity of closely packed optical fibers extending from the inside to the outside thereof;

a uniform layer of phosphor inside said faceplate and adapted to emit light in a selected band;

a shadow mask positioned inside the envelope adjacent said faceplate and having apertures therein;

electron beam generating means adapted to generate a plurality of electron beams originating from spaced apart positions such that different arrays of zones on said phosphor layer may be irradiated through said shadow mask with respective different ones of said beams, each said zone having an area defined by a shadow mask aperture and by a corresponding beam which covers the ends of a plurality of said optical fibres;

scanning means for causing said beams to scan said phosphor layer in line scan and frame scan directions; and

a plurality of arrays of colour elements outside said faceplate located at positions corresponding respectively to the positions of said different arrays of zones so that each said zone is connected to its corresponding said colour element by the optical fibres covered by said zone, each colour element being adapted to provide light upon the transmission of light thereto through said optical fibres from the corresponding zone of said phosphor layer, the colour elements of the same colour element array being adapted to provide light of the same colour, and the different colour element arrays being adapted to provide light of different colours.

4,701,790

METHOD AND APPARATUS FOR COLOR SEPARATION IN AN IMAGE REPRODUCTION SCANNER

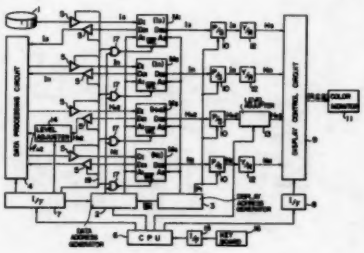
Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Japan

Filed Mar. 29, 1985, Ser. No. 718,154

Claims priority, application Japan, Jun. 13, 1984, 59-120008; Jul. 20, 1984, 59-149380

Int. Cl.[4] H04N *1/46*

U.S. Cl. 358—75 **21 Claims**



1. A color separation method for converting picture signals, obtained by photoelectrically scanning an original picture with a color separation optical system, into reproducible picture image signals, each reproducible picture image signal representing a different king of color ink, comprising the steps of;

converting the picture image signals obtained by photoelectrically scanning the original color picture into first color separation signals and skeleton black signals, or a closely related variant thereof;

converting said first color separation signals and skeleton print signals, or a closely related variant thereof, into second color separation signals;

calculating the value of the difference between the first color separation signals and the second color separation signals;

converting the second color separation signals, corrected according to the value of difference, into third color separation signals;

comparing a picture based upon the first color separation signals with a picture based upon the third color separation signals, by displaying same on a color monitor; and

conforming the picture image based upon the third color separation signals to a picture image based upon the first color separation signals by adjusting the correction amount of the second color separation signals.

4,701,791

SYSTEM AND METHOD FOR MAPPING GEOSYNCHRONOUS REAL IMAGE DATA INTO IDEALIZED IMAGES

Duncan MacPherson, El Segundo, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 644,478, Aug. 24, 1984, abandoned. This application Mar. 5, 1987, Ser. No. 20,215

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—109 **4 Claims**

1. In a satellite imaging system including a satellite nominally at a reference position in geosynchronous orbit; the satellite including an imager for producing scene image data, the image data being in the form of pixel intensities and locations, said system including means for providing imager attitude and satellite position determinations; an improvement which allows for the construction of images from the perspective of the

nominal satellite reference position during satellite position deviations from said reference position comprising:

means for transforming the image data into an idealized

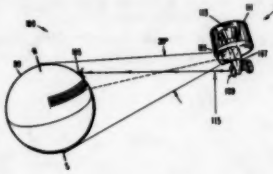


image representing the scene from the perspective of a reference position, said transforming means utilizing the attitude and position determination to produce said idealized image.

4,701,792

PICTURE TUBE WITH VIDEO OUTPUT, PICTURE TAKING SYSTEM UTILIZING SUCH TUBE AND OPERATING PROCESS OF SAID TUBE

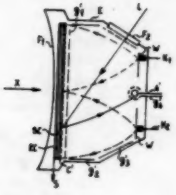
Lucien Guyot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 9, 1985, Ser. No. 774,037

Claims priority, application France, Sep. 7, 1984, 84 13815

Int. Cl.[4] G03C 5/17

U.S. Cl. 358—111 **20 Claims**



1. A picture tube with video output for transforming incident radiation into an electrical signal comprising

a vacuum enclosure including an entrance window transparent to the radiation and an entrance window transparent to a light beam,

an assembly including a screen and a photocathode forming a mosaic of picture storage elements positioned to intercept the radiation passing into the enclosure for converting it into a stream of emitted electrons and for storing the pattern of the incident radiation,

means for setting the maximum potential of the photocathode and for provoking the emission of the electrons,

means for establishing a reference potential on the photocathode by electron bombardment,

means for providing a light beam for scanning the photocathode and for establishing said maximum potential on the photocathode by the photoemission of electrons, and

means for collecting the video output signal formed during the scanning of the photocathode, and electron optics for controlling the flow of the different streams of electrons.

4,701,793

TELEVISION DISPLAY SYSTEM WITH FLICKER REDUCTION PROCESSOR

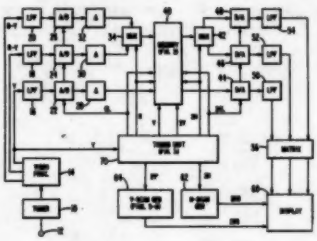
Willem den Hollander, Schlieren, and Giovanni M. Leonardi, Zurich, both of Switzerland, assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1986, Ser. No. 857,375

Claims priority, application United Kingdom, Apr. 11, 1986, 8608876

Int. Cl.[4] H04N 5/02, 5/04, 5/21

U.S. Cl. 358—140 **13 Claims**



1. A television display system, comprising:

input means for receiving an interlaced video input signal having a given field rate;

memory means coupled to said input means, said memory means having a write cycle for storing a field of said input signal and having first and second read cycles for recovering a previously stored field two times during said write cycle for providing a video output signal of double said given field rate;

display means coupled to said memory means for displaying said double field rate video output signal; and

timing means responsive to said video input signal for supplying a read control signal to said memory means for initiating said read cycles, said read control signal having a pulse waveform that repeats on a two-field basis, said timing means further supplying a vertical synchronizing signal to said display means having a pulse waveform that repeats on a four-field basis, each said pulse waveform having a nominal frequency of double said given field rate, said two-field and four-field pulse waveforms being selected to provide an image on said display means in which even fields overlay even fields, odd fields overlay odd fields and in which even and odd pairs of fields are interlaced.

4,701,794

TELEVISION RECEIVER COMPRISING A TELETEXT DECODING CIRCUIT AND A PAGE NUMBER MEMORY

Melchert H. Fröling, and Herman J. R. Schmitz, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,636

Claims priority, application Netherlands, Jan. 9, 1985, 8500047

Int. Cl.[4] H04N 7/04

U.S. Cl. 358—147 **2 Claims**

1. A television receiver comprising:

a control system for generating in response to external manipulations control instructions including teletext page numbers of teletext pages to be displayed on said television receiver;

a teletext-decoder circuit having a page number input for receiving from said control system page numbers of teletext pages to be displayed and having a picture output applying the picture signal of the teletext page to be displayed;

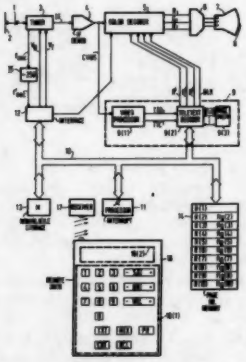
a picture screen coupled to display the picture signal from the picture signal output of the teletext decoder circuit, said picture screen displaying a teletext page which is identified by an associated page number;

page number storage means for storing a plurality of page number; and

a programmable control circuit coupled to the page number storage means and to the control system for receiving the control instructions, and to said page number input of the teletext decoder circuit to apply teletext page numbers thereto, the control circuit being programmed for carrying out the steps of:

storing in the page number storage means a first series of preselected teletext page numbers selected by a user in the order in which the corresponding teletext pages are desired for display;

successively applying the teletext page numbers of said first



series to the teletext-decoder in response to successive occurrences of a selected first control instruction for successively displaying the teletext pages corresponding to the teletext page numbers successively applied to the teletext-decoder;

interrupting the successive application of teletext page numbers of said first series to the teletext-decoder in response to the occurrence of a selected further control instruction;

storing intermediate teletext page numbers in the order in which the corresponding teletext pages are desired for display;

successively applying the intermediate teletext page number to the teletext-decoder in response to successive further occurrences of the selected control instruction; and

continuing the successive application of the remainder teletext page numbers of said first series to the teletext decoder after all the intermediate teletext page numbers have been applied thereto.

4,701,795

METHOD AND MEANS TO ELIMINATE INTERACTION BETWEEN CLOSELY LOCATED CATHODE RAY TUBES

Edward W. Andrews, Brookfield, and Roy A. Schley, Milwaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

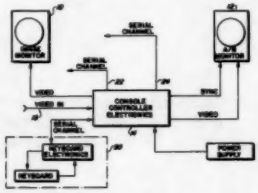
Filed Nov. 4, 1985, Ser. No. 794,676
Int. Cl.[4] H04N *5/06*
U.S. Cl. 358—150 **5 Claims**

1. A method for eliminating visible electromagnetic interaction between cathode ray tube video monitors positioned in close proximity and each displaying a different set of image data including horizontal and vertical sync signals respectively from unsynchronized video sources, at least one of the sources having an adjustable sync generation circuit, and an other of the sources providing one of the sets of image data including horizontal and vertical sync signals, comprising the steps of:

(a) obtaining first vertical synchronizing signals from the image data from the other of the sources;

(b) obtaining second vertical synchronizing signals from the adjustable video sync generation circuit;

(c) comparing the first vertical synchronizing signals to the second vertical synchronizing signals for deriving a con-



trol signal indicative of at least one of the phase and frequency difference between said first and second vertical synchronizing signals; and

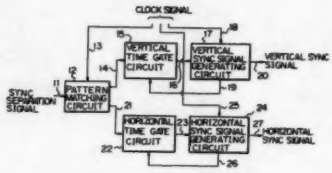
(d) applying the control signal to the adjustable video sync generation circuit in a manner to minimize the phase and frequency difference of the vertical sync signals without synchronizing the horizontal sync signals in the sets of image data.

4,701,796

SYNCHRONIZATION SIGNAL GENERATING CIRCUIT

Kiyoshi Kamiya, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,956
Claims priority, application Japan, Nov. 24, 1983, 58-221208
Int. Cl.[4] H04N *5/10*
U.S. Cl. 358—154 **1 Claim**



1. A synchronization signal generating circuit for producing horizontal sync signal pulses and vertical sync signal pulses from a sync separation signal which is derived from a composite video signal, comprising:

pattern matching circuit means for performing recognition of vertical sync pulse components in said sync separation signal to generate a vertical pattern detection pulse in synchronism with each of said vertical sync pulse components and for performing recognition of horizontal sync pulse components in said sync separation signal to generate a horizontal pattern detection pulse in synchronism with each of said horizontal sync pulse components;

vertical time gate circuit means coupled to receive said vertical pattern detection pulses from said pattern matching circuit means, operable to be set in an open state in which reset pulses are output therefrom in response to successive ones of said vertical pattern detection pulses and to immediately enter a closed state following output of each of said reset pulses, in which the output of the reset pulses therefrom is inhibited;

vertical sync signal generating circuit means comprising first

counter circuit means for counting pulses of a first clock signal, said first counter circuit means being reset to a predetermined initial state by each of said reset pulses, said verticaly sync signal generating circuit means acting to synthesize a vertical sync signal pulse in response to the resetting of said counter circuit means by each of said reset pulses and further acting to reset said counter circuit means to said initial count state and to synthesize one of said vertical sync signal pulses when a first predetermined time interval corresponding to a predetermined count value of said counter circuit means has elapsed following generation of one of said reset pulses, said vertical sync signal generating circuit means further acting to set said vertical time gate circuit means in said open state thereof, following input of a reset signal to said vertical sync signal generating circuit means, after a second time interval has elapsed following generation of one of said reset pulses, where said second time interval is shorter than said first predetermined time interval;

horizontal time gate circuit means coupled to receive said horizontal pattern detection pulses from said pattern matching circuit means, operable to be set in an open state in which reset pulses are output therefrom in response to successive ones of said horizontal pattern detection pulses and to immediately enter a closed state following output of each of said reset pulses therefrom, in which the output of the reset pulses therefrom is inhibited, and;

horizontal sync signal generating circuit means comprising second counter circuit means for counting pulses of a second clock signal, said second counter circuit means being reset to a predetermined initial state by each of said reset pulses from said horizontal time gate circuit means, said horizontal sync signal generating circuit means acting to synthesize a horizontal sync signal pulse in response to resetting of said second counter circuit means by each of said reset pulses and further acting to reset said second counter circuit means to said initial count state and to synthesize one of said horizontal sync signal pulses when a third predetermined time interval corresponding to a predetermined count value of said second counter circuit means has elapsed following generation of one of said reset pulses from said horizontal time gate circuit means, said horizontal sync signal generating circuit means further acting to set said horizontal time gate circuit means in said open state thereof, following input of a reset signal to said horizontal sync signal generating circuit means, after a fourth time interval has elapsed following generation of one of said reset pulses from said horizontal time gate circuit means, where said fourth time interval is shorter than said third predetermined time interval;

said pattern matching means comprising third counter circuit means coupled to count pulses of a third clock signal and controlled by said sync separation signal such as to be enabled to count said third clock signal pulses only while said sync separation signal remains at a first predetermined potential level and to be otherwise held in a reset condition, said third counter circuit means producing a pulse constituting one of said vertical pattern detection pulses after said sync separation signal has remained at said first predetermined potential level for a fifth predetermined time interval, corresponding to a specific count value of said third counter circuit means, and further comprising circuit means coupled to receive count output signals from said third counter circuit means and comprising a differentiator circuit coupled to receive said sync separation signal, having a first output terminal for producing an output pulse each time a transition of said sync separation signal from a second predetermined potential level to said first potential level occurs and a second output terminal for producing an output pulse each time a transition of said sync separation signal from said first potential level to said second potential level occurs, a logic gate having an input terminal coupled to said differentiator circuit first output terminal, and a latch circuit for controlling said logic gate circuit, said latch circuit being controlled by said pulses from said differentiator circuit second output terminal and by said count output signals from said third counter circuit means such as to be set in a state inhibiting transfer of said pulses from said differentiator circuit first output terminal through said logic gate, in response to each of said output pulses from said differentiator circuit second output terminal and also in response to said third counter circuit means attaining said second count value, and being set in a state enabling transfer therethrough of said pulses from said differentiator circuit first output terminal in response to said third counter circuit means attaining said first count value, for thereby producing an output pulse constituting one of said horizontal pattern detection pulses each time said sync separation signal remains at said predetermined potential level for more than a sixth predetermined time duration and less than a seventh predetermined time interval, said sixth and seventh predetermined time intervals respectively corresponding to attainment of first and second count values by said third counter circuit means.

4,701,797

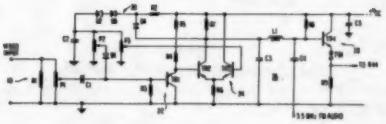
MINIATURE TELEVISION TRANSMITTER

Leonidas Ferreira, Brussels, Belgium, assignor to C³ E M Company Ltd., London, England

Filed Jun. 7, 1984, Ser. No. 618,297

Int. Cl.⁴ H04N *5/38*

U.S. Cl. 358—186 **41 Claims**



1. A tv transmitter comprising:

a video amplifier for amplifying a composite video signal applied at an input thereof;

a single ended differential amplifier connected to said video amplifier for amplifying the output of said video amplifier;

a low pass filter connected to the output of said differential amplifier for filtering out high frequency components;

a modulator connected to receive the output of said low pass filter and an r.f. carrier for modulating the video signal output from said low pass filter onto said r.f. carrier; and

bias circuit means connected to said video amplifier for providing a variable bias thereto to adjust the dc level of said video signal.

4,701,798

ELECTRONIC STILL CAMERA SYSTEM WITH DIFFERENTIAL ERROR-CORRECTING MEANS

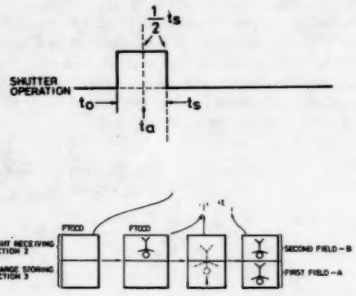
Masatoshi Tabei, and Kazuhiro Kawajiri, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 13, 1986, Ser. No. 873,887

Claims priority, application Japan, Jun. 14, 1985, 60-128290; Aug. 16, 1985, 60-179305; Sep. 5, 1985, 60-194746; Sep. 10, 1985, 60-198603

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.26 **15 Claims**



1. An electronic camera system, comprising:

a dark box having an aperture;

an image forming optical system facing said aperture;

a shutter facing said aperture;

a light receiving section comprising a CCD disposed inside said box;

means for carrying out a false reading of said CCD;

means for controlling said shutter to expose said CCD for an exposure period subsequent to said false reading;

a charge storing section;

means for transferring charge signals from said light receiving section to said charge storing section during said exposure period in a transferring time much shorter than said exposure period; and

means for sequentially reading out charge signals from said light receiving section and said charge storing section subsequent to said exposure period.

4,701,799

IMAGE DISPLAY PANEL DRIVE

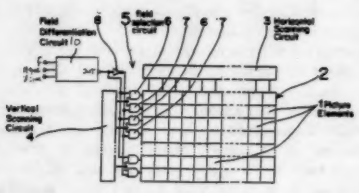
Masahiro Yoshimura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 12, 1985, Ser. No. 711,076

Claims priority, application Japan, Mar. 13, 1984, 59-48665; Jul. 20, 1984, 59-151696

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—241 **12 Claims**



1. An image panel display drive system, comprising:

a display;

horizontal driving means for scanning a plurality of horizontal fields of said display;

vertical driving means for scanning a plurality of vertical fields of said display;

differentiation means for producing a field selection signal; and

selection means, connected to said vertical driving means for permitting said vertical driving means to selectively scan said display in an interlace or non-interlace mode in accordance with said field selection signal.

4,701,800

SCANNING LINE POSITION CONTROL SYSTEM FOR SHIFTING THE POSITION OF SCANNING LINES TO IMPROVE PHOTOGRAPHIC REPRODUCTION QUALITY

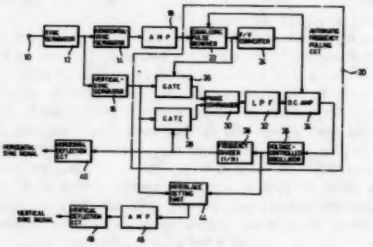
Taizo Akimoto, Minamiashigara, and Asaki Nagai, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd. and Ikegami Tsushinki Co., Ltd., both of, Japan

Filed Jul. 29, 1986, Ser. No. 890,267

Claims priority, application Japan, Jul. 29, 1985, 60-167294; Jul. 29, 1985, 60-167295

Int. Cl.[4] H04N *5/262, 5/04, 7/01*

U.S. Cl. 358—244 **5 Claims**



1. A scanning line position control system comprising:

signal generator means for generating a signal, having a frequency Nfh, in synronism with a horizontal synchronizing signal, having a frequency fh, separated from a composite video signal;

a multiplex interlace setting unit receptive of the signal from said generator means and a vertical synchronizing signal separated from said composite video signal, said multiplex interlace setting unit producing an output vertical deflection signal such that the respective scanning lines, which are to be reproduced in response to said composite video signal, are vertically shifted to a plurality of positions to improve the reproduction quality of images produced using said scanning lines; and

a vertical deflection circuit triggerable by an output signal from said multiplex interlace setting unit.

4,701,801

CONDUCTIVE SCREEN FOR VIDEO DISPLAY UNIT

Martin E. Hobbins, Richmond Hill; Robert G. Dickie, New Market, and Rene Pardo, Toronto, all of Canada, assignors to Northern Technologies Ltd., Markham, Canada

Continuation-in-part of Ser. No. 840,393, Mar. 17, 1986. This application Sep. 5, 1986, Ser. No. 904,165

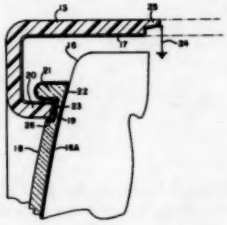
Int. Cl.[4] H04M *5/65*

U.S. Cl. 353—245 **5 Claims**

1. In a video display unit of the type including a cathode ray tube and a housing for the cathode ray tube having a bezel with an opening for viewing the face of the cathode ray tube, the improvement comprising:

(a) a face plate through which the face of said cathode ray tube can be viewed;

(b) means located around the periphery of said face plate for conducting electricity from said face plate, including a stepped portion of said face plate around the periphery of said face plate; and



(c) means between the bezel and said face plate extending around 360° of the opening in the bezel for holding said face plate and for electrically connecting said face plate to the bezel, said means including the bezel having a ridge which engages the stepped portion of said face plate.

4,701,802

CATHODE-RAY TUBE WITH MISALIGNMENT CORRECTING TENSION BAND

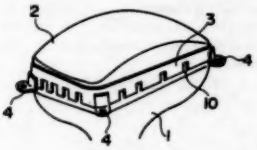
Kazuo Omae, Saitama, and Hiroshi Okazaki, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 3, 1986, Ser. No. 835,518

Claims priority, application Japan, Mar. 8, 1985, 60-45981

Int. Cl.⁴ H04N *5/65*

U.S. Cl. 358—246 **11 Claims**



1. A cathode-ray tube comprising an explosion-proof tension band fitted on the periphery of the panel of the tube body of the cathode-ray tube adapted to apply a compressive force to the periphery of said tube as a result of tension in said band, said band having recesses formed so as to adjust the effective sectional area thereof to a value appropriate for correcting the deformation of the panel caused by the evacuation of the tube body and causing the misalignment of electron beams on the fluorescent surface of the panel.

4,701,803

IMAGE DATA COMPRESSION APPARATUS

Yukio Sato, Inagi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1985, Ser. No. 739,072

Claims priority, application Japan, Jun. 5, 1984, 59-114838; Jun. 5, 1984, 59-114839; Jun. 5, 1984, 59-114840

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—260 **10 Claims**

1. An image data compression apparatus comprising:

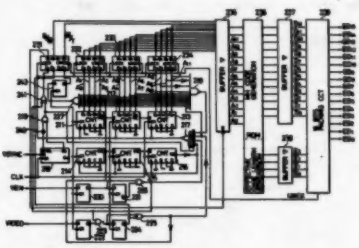
means for entering binary signals representing that each pel thereof is a white or a black pel;

means for counting numbers of continuous white and black pels of the binary signals entered from said input means;

means for detecting a changing point of the color related to the binary signals entered from said input means;

compression means for generating a compressed image code or codes representing a count of said counting means when said changing point is detected by said detecting means; and

means for discriminating that a count of said counting means has reached a predetermined value;



wherein said compression means generates, even in the event that such changing point is not detected by said detecting means, a compressed image code representing the predetermined value, when said discriminating means discriminates that a count of said counting means has reached the predetermined value.

4,701,804

IMAGE READING APPARATUS

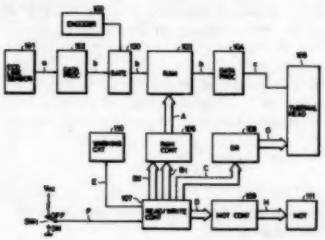
Kenji Toyoda, Chigasaki, and Toru Hishinuma, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 3, 1985, Ser. No. 730,046

Claims priority, application Japan, May 11, 1984, 59-94055

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—280 **5 Claims**



1. An image reading apparatus for reading an image of an object, including:

(a) converting means for converting the image of the object into an image signal;

(b) memory means;

(c) writing means for writing the image signal into said memory means;

(d) reading means for reading out the image signal written in said memory means;

(e) detecting means for detecting a difference between an amount of the image signal written in said memory means by said writing means and an amount of the image signal read out from said memory means by said reading means and for producing a detection signal upon detecting that said detected difference has reached a predetermined value; and

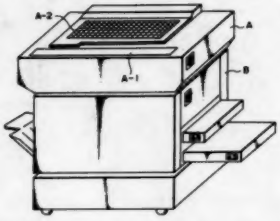
(f) means for producing a warning signal in response to said detection signal.

4,701,805

IMAGE PROCESSING SYSTEM WITH REAL TIME IMAGE PROCESS

Katsuyoshi Maeshima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1984, Ser. No. 615,098
Claims priority, application Japan, Jun. 1, 1983, 58-97170
Int. Cl.[4] H04N *1/40, 1/10*
U.S. Cl. 358—282 **23 Claims**



1. An image processing system comprising:
means for reading an image which comprises at least one page;
means for processing image data from said reading means to generate a video signal; and
means for identifying at least one of a dimension and a position of the image to generate an image state signal in accordance with the identified dimension or position, respectively;
wherein said process mean processes the image data on the basis of the image state signal generated by said identifying means, and mutually different data processes are executed respectively in accordance with a first parameter in identification by said identifying means and a second parameter in image data processing by said process means, said first and second parameters being different from each other, and said mutually different data processes being executed during the reading of one page of the image by said reading means, and
wherein said identifying means identifies the image state in accordance with image data read by pre-scan of the image prior to scan of the image by said process means.

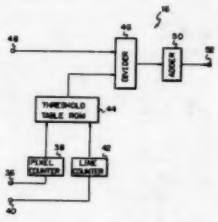
4,701,806

ADAPTIVE PSEUDO HALFTONE GENERATOR

Yosuke Takashima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 20, 1985, Ser. No. 703,570
Claims priority, application Japan, Feb. 20, 1984, 59-29733
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—283 **13 Claims**

1. An adaptive pseudo halftone generator for adaptively converting to a pseudo halftone an input video signal, said signal defining a plurality of sequentially occurring pixels, each having a tone value, and being representative of a binary image and an image with continuous tones, comprising:
computing means for computing a contrast value (N) indicative of a degree of continuity of tones of the input image signal by sequentially comparing the tone of an observed pixel with the tones of plural surrounding pixels;
threshold preparing means for preparing a threshold value (T) by controlling an amplitude of a periodically varying threshold value on the basis of said contrast value N, said threshold value T being variable with the contrast value N such that as N increases, T approaches a first threshold T_1, which is adapted for binarization of line images and as N decreases, T approaches a second threshold T_2 which is adapted for the binarization of images with halftones; and



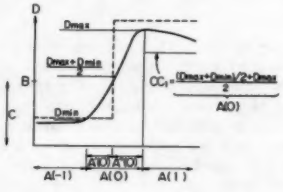
digitizing means for digitizing the input video signal with respect to the threshold value output from said threshold preparing means to convert the input video signal to a pseudo halftone.

4,701,807

METHOD AND APPARATUS FOR PROCESSING AN IMAGE

Yoshitaka Ogino, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1984, Ser. No. 650,267
Claims priority, application Japan, Sep. 22, 1983, 58-174377; Sep. 22, 1983, 58-174378
Int. Cl.[4] H04N *1/40, 1/10*
U.S. Cl. 358—284 **11 Claims**



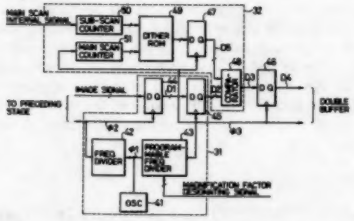
1. An image processing apparatus comprising:
image data input means;
first process means for processing image data from said input means in a first process mode;
second process means for processing image data from said input means in a second process mode; and
determining means for determining a characteristic of the image data from said input means and for selecting the first or second process mode in accordance with the determination result,
said determining means determining a characteristic of the image data under consideration on the basis of both a parameter based on ambient input image data and the result from determination of the characteristic of the ambient image data.

4,701,808

IMAGE PROCESSING APPARATUS WITH VARIABLE MAGNIFICATION AND GRAY LEVEL PROCESSING

Nao Nagashima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1984, Ser. No. 664,539
Claims priority, application Japan, Nov. 1, 1983, 58-206337; Nov. 1, 1983, 58-206338
Int. Cl.[4] H04N *1/40, 1/04*
U.S. Cl. 358—287 9 Claims



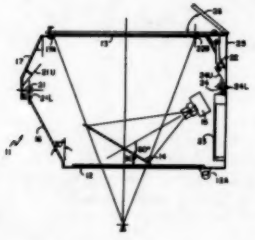
1. An image processing apparatus comprising:
input means for inputting a digital image signal transferred in accordance with a clock of a predetermined frequency;
variable magnification processing means for magnification-processing the digital image signal by using a sampling clock of a frequency different from the predetermined frequency, said sampling clock corresponding to a variable magnification; and
half-tone processing means for half-tone processing the digital image signal magnification-processed by said variable magnification processing means.

4,701,809

IMAGING LARGE DOCUMENTS

Douglas J. Barrett, Bedford, Mass., assignor to Eikonix Corporation, Bedford, Mass.

Filed May 22, 1986, Ser. No. 866,133
Int. Cl.[4] H04N *1/10, 1/40*
U.S. Cl. 358—293 4 Claims



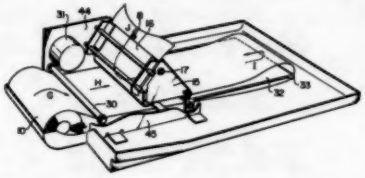
1. Large document imaging apparatus comprising,
cabinet means for supporting said apparatus,
said cabinet means including a transparent top plate for supporting large documents to be imaged, a base and side panels,
camera means supported in said cabinet means and having lens means characterized by falloff for focusing images of said large documents,
mirror means inside said cabinet means angled upward from said base for reflecting the image of a document on said transparent top plate upon the image plane of said camera means to define an image region bounded by said transparent top plate, said mirror means and rays extending between the edges of said transparent top plate and the edges of said mirror means,
and illuminating means in said cabinet means outside said image region nonuniformly illuminating said transparent top plate with increasing intensity toward the edges thereof to compensate for said falloff.

4,701,810

FACSIMILE APPARATUS

Yoshihiro Ikemoto, Katano; Jiro Kataoka, Kawanishi; Toshinori Otsuki, Yawata, and Takuji Nakamura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Jul. 28, 1986, Ser. No. 889,859
Claims priority, application Japan, Jul. 30, 1985, 60-167903
Int. Cl.[4] H04N *1/21, 1/23;* G01D *9/00*
U.S. Cl. 358—296 8 Claims



1. A facsimile apparatus comprising:
a recording paper accommodating portion for accommodating a continuous length of recording paper;
a script table having a flat upper surface and disposed midway along a feed passage for said recording paper, said recording paper with its non-recording surface upturned being place on said script table;
a reading section disposed midway along said feed passage of said recording paper and adapted to allow scripts written on said non-recording surface of said recording paper to be read;
a recording section disposed midway along said feed passage of said recording paper and adapted for recording on said recording surface of said recording paper;
a conveying section including a motor for conveying said recording paper along said feed passage;
a detecting section provided along said feed passage of the recording paper, for detecting the presence of the recording paper,
a control section controlling said motor in accordance with a signal from said paper detecting section, and
a transmitting and receiving section for transmitting a signal read through said reading section and for receiving a signal to be supplied to said recording section.

4,701,811

TONE REPRODUCTION METHOD AND APPARATUS

Haruhiko Moriguchi; Toshiharu Inui, and Yoshihiro Ishida, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

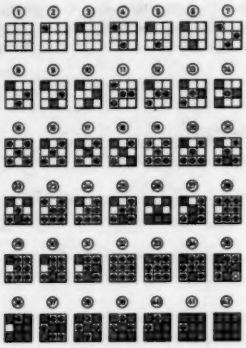
Filed May 14, 1985, Ser. No. 733,770
Claims priority, application Japan, May 15, 1984, 59-95672
Int. Cl.[4] H04N *1/30, 1/40*
U.S. Cl. 358—298 3 Claims

1. A method of recording a picture by a pattern of dots representing half-tone density images derived from a picture signal representing the picture, the method comprising the steps of:
(a) assigning different picture elements to represent different portions of said picture signal, each picture element being capable of assuming one of first, second, and third half-tone levels corresponding to no dot, a partial dot or a full

dot wherein a partial dot is smaller in area than a full dot and larger than half of the area of a full dot;

(b) grouping said picture elements into a plurality of different half-tone expressing units, each of said expressing units including a first number of different picture elements and corresponding to an area of the picture comprising of the portions of the picture signal represented by said picture elements included in said expressing unit;

(c) determining which of a second number of half-tone gradations corresponds to each expressing unit by analyzing said picture signal, each said gradation correspponding to a different half-tone gradation within a range of



half-tone densities from white to black and each of said second number of half tone gradations being represented by a unique combination of picture element half-tone levels such that the half-tone level of each of said picture element half-tone levels may both increase and decrease with an increase in said half-tone gradations within said range; and

(d) recording, for each said determined gradation, the half-tone levels for the picture elements in said corresponding half-tone expressing unit by not printing a dot to represent said first half-tone level or by printing a partial dot or full dot to represent said second and third half-tone levels, respectively.

4,701,812

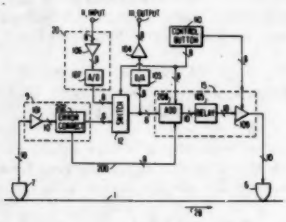
PCM RECORDING AND REPRODUCING APPARATUS

Kunimaro Tanaka, and Minoru Ozaki, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 438,552, Nov. 2, 1982, abandoned. This application Jun. 18, 1985, Ser. No. 745,833

Int. Cl.[4] G11B *5/09, 27/02*

U.S. Cl. 360—32 **6 Claims**



1. A PCM recording and reproducing apparatus comprising: means for initialy assigning a single track or a plurality of tracks on a recording medium per channel of an original audio signal and for recording the audio signal as a digital signal on said tracks; means for generating error-correcting redundant signals from the channels of audio signals and for subsequently recording the error-correcting redundant signals on a plularity of tracks different from said initial tracks; means for adding an error-detecting redundant signal to each of said subsequent tracks; means for rewriting the original audio signal in a certain channel and the corresponding errorcorrecting redundant signal in an overdubbing process in which a new audio signal is rerecorded in said certain channel while reproducing the original audio signal that has already been recorded; means for issuing an errorcorrection inhibit signal per track when an error in excess of a predetermined error-correcting ability is produced in a portion of a recording medium where said original audio signal is reproduced; and means for detecting a track where the signal is not rerecorded from the error-correction inhibit signals and for forcibly bringing the error-correcting redundant signal into error when at least one error-correction inhibit track is not recorded.

4,701,813

METHOD OF PROTECTING A MAGNETIC RECORDING MEDIUM IN A MAGNETIC RECORDING/PLAYBACK SYSTEM AND APPARATUS THEREFOR

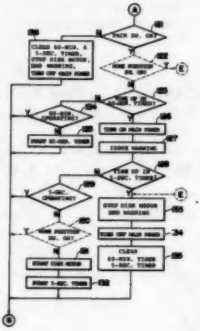
Izumi Miyake; Kiyotaka Kaneko, both of Kawasaki, and Kazuya Oda, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 7, 1986, Ser. No. 894,020

Claims priority, application Japan, Aug. 14, 1985, 60-177579

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—71 **6 Claims**



1. A method of protecting a magnetic recording medium in a magnetic recording/playback system for recording a signal on or playing back a signal from any track of a magnetic recording medium by moving a magnetic recording/playback head radially of the magnetic recording medium while said medium is rotating, said method comprising the following steps executed by a control unit operated on electric power from an auxiliary power supply:

(a) sensing that a main power supply, which supplies power to the magnetic recording/playback system with the exception of the control unit, is in an off state;

(b) sensing that the magnetic recording medium has been loaded at a predetermined position;

(c) measuring a time period over which the main power supply continues to remain in the off state and the magnetic recording medium continues to remain load at the predetermined position, and determining whether the measured time period has attained a first predetermined time period; and

(d) running a motor for driving the magnetic recording

medium for a second predetermined time period when it is determined at said step (c) that the measured time period has attained the first predetermined time period.

4,701,814

MESSAGE LOCATION CALIBRATION METHOD AND SYSTEM

Michael J. Westall, Glendora, Calif., assignor to Avicom International, Inc., Pasadena, Calif.

Filed Jan. 17, 1986, Ser. No. 820,542

Int. Cl.[4] G11B *15/18*

U.S. Cl. 360—72.3 **39 Claims**

1. A method of calibrating addresses of messages on a copy record duplicated from a master record of said messages having known addresses, comprising the steps of:

recording on said master record, prior to duplication thereof, a first cue and a second cue separated by a determined distance along a track of said master record,

determining the distance between a first duplicated cue and a second duplicated cue along a track of said copy record, said first and second duplicated cues being duplicated on said copy record from said first and second cues recorded on said master record,

deriving a correction factor from said determined distance between said cues on said copy record and said determined distance between said cues on said master record, and

applying said correction factor to the address of a selected message on said master record to obtain a corrected address of said selected message on said copy record.

4,701,815

TRACKING SERVO SYSTEM FOR DISC MEMORY

Hiroaki Yada; Shigeyoshi Imakoshi; Hideo Suyama; Tetsuo Sekiya, all of Kanagawa, and Masayuki Nakayama, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 836,714

Claims priority, application Japan, Mar. 11, 1985, 60-47951; Mar. 14, 1985, 60-50807; Mar. 14, 1985, 60-50808; Mar. 25, 1985, 60-60109

Int. Cl.[4] G11B *5/596*

U.S. Cl. 360—77 **18 Claims**

1. A servo system for positioning data transducer means relative to a plurality of substantially concentric data tracks on opposed surfaces of a magnetic disc, said system comprising:

(a) data transducer means including at least first and second data transducer members respectively located relative to opposed surfaces of said magnetic disc;

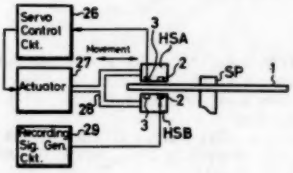
(b) servo transducer means, including at least a first and a second pair of servo transducers respectively located relative to opposed surfaces of said magnetic disc and adjacent to one of said first and said second data transducer members, for sensing data tracks and generating output signals representative of a data signal written on the sensed track, a distance between said servo transducers of each of said pairs being related to the dimension of an associated data track and a distance between a pair of said servo transducers and said associated data transducer member being related to a data track pitch;

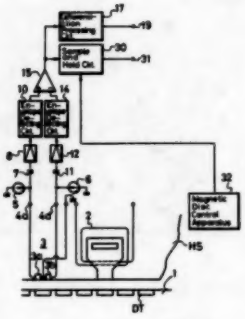
(c) signal processing means connecting to said pairs of servo transducers for generating a transducer positioning signal; and

(d) positioning means for positioning one of said data transducer members in response to said transducer positioning signal derived from another transducer member located relative to the surface of said disc opposite to the surface with which said one of said data transducer members is associated, when said one data transducer member is in a writing mode, and for maintaining a track centerline alignment of said one transducer member.

5. A servo system for positioning data transducer means relative to a plurality of substantially concentric data tracks on a surface of a magnetic disc, said system comprising:

(a) a pair of servo transducers for sensing said data tracks





and generating output signals representative of a data signal written on the sensed track, a distance between said servo transducers being related to the dimension of said data track and a distance between said servo transducers and said data transducer means being related to a data track pitch;

(b) signal processing means connected to said pair of servo transducers for generating a transducer positioning signal; said signal processing means including sample and hold means for sampling and holding said transducer positioning signal before a writing operation of said data transducer means and for supplying the sampled and held signal to said positioning means during the writing operating of said data transducer means; and

(c) positioning means for positioning said data transducer means in response to said transducer positioning signal and for maintaining a track centerline alignment of said data transducer means.

12. A servo system for positioning data transducer means relative to a plurality of substantially concentric data tracks divided into a plurality of data sections which provide gap

portions therebetween on a surface of a magnetic disc, said system comprising:

(a) a pair of servo transducers for sensing said data tracks and generating output signals representative of a data signal written on the sensed track, a distance between said servo transducers being related to the dimension of said data track and a distance between said servo transducers and said data transducer means being relating to a data track pitch;

(b) signal processing means connected to said pair of servo transducers for generating a transducer positioning signal, said signal processing means including sample and hold means for sampling and holding said transducer positioning signal derived from said gap portions and for supplying the sampled and held signal to said positioning means, whereby a track centerline alignment of said data transducer means over said data sectors is maintained with said sampled and held signal; and

(c) positioning means for positioning said data transducer means in response to said transducer positioning signal and for maintaining a track centerline alignment of said data transducer means.

4,701,816

CAPSTAN FRICTION DRIVE APPARATUS OF TAPE RECORDER

Mitsuru Ida, Koshigaya, Japan, assignor to Sony Corporation, Tokyo, Japan

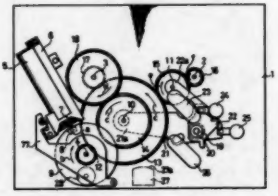
PCT No. PCT/JP83/00225, § 371 Date Mar. 14, 1984, § 102(e) Date Mar. 14, 1984, PCT Pub. No. WO84/00590, PCT Pub. Date Feb. 16, 1984

PCT Filed Jul. 13, 1983, Ser. No. 596,454

Claims priority, application Japan, Jul. 22, 1982, 57-127967

Int. Cl.[4] G11B *5/008*

U.S. Cl. 360—96.4 **6 Claims**



1. A friction drive apparatus for a tape recorder comprising

a flywheel,

a capstan mounted on said flywheel,

a motor,

a friction wheel mounted on a rotary shaft of said motor and being adapted to be brouoht into slidable contact with said flywheel on which said capstan is mounted for transmitting a rotational force to the flywheel,

a support mechanism for pivotally supporting said friction wheel about a pivot point which is eccentric with respect to said rotary shaft on which the friction wheel is mounted, and

biasing means for pivotally biasing said friction wheel about said pivot point toward a contact surface of the flywheel, said biasing means being adapted to apply a predetermined initial contact pressure between said friction wheel and flywheel, and the direction of rotation of the friction wheel being determined such that a reaction force at said contact surface occurring upon rotation of the friction wheel acts in a direction which causes pivotal movement of the friction wheel in the same sense in which the biasing means acts, thereby increasing the contact pressure between the friction wheel and the flywheel above said initial contact pressure,

said support mechanism for pivotally supporting said motor including a pair of support members which are respectively disposed at opposite axial ends of said motor, so as thereby to support the friction wheel, the pair of support members being disposed at symmetrically eccentric positions with respect to the axial rotary shaft of the motor, and said pair of support members being arranged such that a line passing therethrough also passes substantially through the axial centre of gravity of the motor, whereby contact pressure between said friction wheel and said flywheel is independent of the weight of the motor.

4,701,817

LOADING AND EJECTING MECHANISM FOR A MAGNETIC TAPE CASSETTE APPARATUS

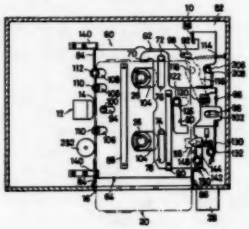
Yasuhiro Uemura, Tanashi, Japan, assignor to Teac Corp. & Nippon Landex Ltd., Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,293

Claims priority, application Japan, Oct. 14, 1983, 58-191835

Int. Cl.[4] G11B *5/008, 15/00*

U.S. Cl. 360—96.5 **7 Claims**



1. An apparatus for data transfer with a magnetic tape cassette of the type having a generally flat boxlike housing accommodating a length of magnetic tape for transportation between a pair of hubs mounted within the housing for independent rotation about respective axes arranged in parallel spaced relationship with each other, the tape being exposed through an aperture in a predetermined front side of the housing extending parallel to a notional line right angularly intersecting the axes of rotation of the hubs, the apparatus comprising:

(a) a casing having defined therein an entrance opening through which the tape cassette is to be inserted into the casing in the direction of the notional line right angularly crossing the axes of rotation of the hubs of the tape cassette, the tape cassette lying in a preassigned retracted position within the casing upon full insertion therein through the entrance opening;

(b) a transducer head mounted within the casing and having a data transfer surface so oriented as to confront with a spacing therebetween the apertured front side of the housing of the tape cassette lying in the retracted position, the transducer head being immovable relative to the casing at least in a direction normal to the data transfer surface thereof;

(c) cassette shift means for reciprocably moving the loaded tape cassette relative to the casing in the principal plane of the loaded cassette and in a direction normal to the notional line between the retracted position and a preassigned working position, the tape cassette when in the working position having its tape in contact with the data transfer surface of the transducer head for data transfer therewith through the apertured front side of the housing of the cassette, said cassette shift means comprising:

a first cassette carriage movable between a first position close to the entrance opening in the casing and a second position away from the entrance opening, the first cassette carriage being normally held in the first position and being moved to the second position by and with the

tape cassette upon insertion thereof to the retracted position within the casing;

a second cassette carriage coacting with the first cassette carriage for holding thereon the tape cassette as the latter reaches the retracted position with the first cassette carriage, the second cassette carriage being movable with the tape cassette between a third position for receiving the tape cassette in its retracted position and a fourth position for holding the tape cassette in its working position;

resilient means for biasing the second cassette carriage from the third toward the fourth position; and

locking means for normally holding the second cassette in the third position against the bias of the resilient means, the locking means allowing the second cassette carriage to travel from the third to the fourth position under the bias of the resilient means upon movement of the first cassette carriage from the first to the second position with the tape cassette;

(d) tape transport means comprising a pair of drive spindles extending perpendicular to the principal plane of the loaded tape cassette for linear movement into and out of driving engagement with the respective hubs of the tape cassette when the latter is in the working position; and

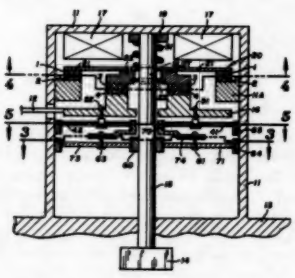
(e) tape transport shift means for reciprocably moving the tape transport means in order to cause the linear movement of the drive spindles thereof into and out of driving engagement with the respective hubs of the tape cassette lying in the working position.

4,701,818

MEANS FOR INDEXING A ROTARY ARM IN SMALL ANGULAR STEPS

Louis G. Gitzendanner, Oklahoma City, Okla., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Feb. 18, 1986, Ser. No. 830,146
Int. Cl.[4] G11B *5/54, 21/08*
U.S. Cl. 360—106 **7 Claims**



1. A device for urging an output arm member in small incremental rotary steps comprising:

housing means,

a stepper motor means having a driven shaft,

first engagement member having first engagement means comprising engagement units which are constructed for detachable engagement with engagement units from other engagement means, said engagement units being of one angular size,

second engagement member having second engagement means comprising second engagement units for detachable engagement with said first engagement units, said second engagement member being firmly and solidly connected to said housing means,

third engagement member having third engagement means and being in solid connection with said first engagement member such that movement of said first and third engagement members occurs in unison as an assembly, and where rotary movement of said assembly is directly linked to movement of said driven shaft, said third engagement means comprising third engagement units having a slightly smaller or larger angular size than the angular size of said first engagement units,

fourth engagement member in solid connection with said arm member and having fourth engagement means comprising fourth engagement units for detachable engagement to said third engagement units, said fourth engagement member being engaged through a gear reduction assembly so arranged and disposed to translate incremental rotations of said driven shaft to increments approximating the measure of the difference between the angular sizes of said first and second engagement units to said driven shaft,

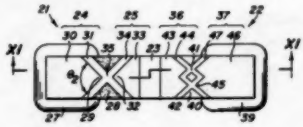
wherein disengagement of said first and third engagement members from said second and fourth engagement members, respectively, allows said first and third engagement members to move in a rotary direction responsive to said stepper motor shaft and wherein reengagement of said first and second engagement members to said third and fourth engagement members, respectively must produce realignment of said third and fourth engagement units to an accuracy on the same order of magnitude as is the difference between the angular sizes of said first and said second engagement units.

4,701,819

MAGNETIC HEAD TO EFFECT HIGH DENSITY MAGNETIC RECORDING

Osamu Inagoya; Hideo Fujiwara, both of Ibaragi; Takeshi Tottori, Toride; Minoru Yamano, Ibaraki; Noriyuki Kumasaka, Oume; Shigekazu Otomo, Sayama; Mitsuhiro Kudo, Tokyo; Juiti Morikawa, Katsuta; Kiyoshi Ishihara, Yokohama; Akira Usui, Ibaragi, and Masashi Hayashi, Ibaragi, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka and Hitachi, Ltd., Tokyo, both of, Japan

Filed Sep. 19, 1985, Ser. No. 777,744
Claims priority, application Japan, Sep. 19, 1984, 59-194874; Sep. 19, 1984, 59-194875; Sep. 19, 1984, 59-194876
Int. Cl.[4] G11B *5/22, 5/42*
U.S. Cl. 360—122 **11 Claims**



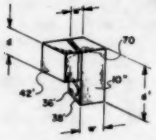
1. A magnetic head comprising a pair of core halves with sides combined with each other through a magnetic gap, each of said core halves comprising a core base having a projecting portion at said respective sides opposing said magnetic gap with slanted surfaces formed on said projecting portions opposing said magnetic gap and a thin magnetic layer formed on said slanted surfaces of said core base opposing said magnetic gap of a magnetic material of high saturation magnetic flux density and having a track width of 40 to 200 μm, wherein at least one of said core halves comprises a coil slot with said thin magnetic layer formed on an inner surface thereof, and the thickness of said thin magnetic layer is defined in such a manner that a minimum value of the total of the product of the cross sectional areas perpendicular to the direction of the magnetic flux of the opposing portions of the respective core halves, except for the magnetic gap forming the magnetic circuit, and the saturation magnetic flux density of said respective portions is greater than the product of the area of the surface of the respective core halves in the magnetic gap and the saturation magnetic flux density of said thin magnetic layer.

4,701,820

SLANT GAP THIN-FILM HEAD HAVING FIRST AND SECOND WEDGE-SHAPED STRUCTURES

Richard J. McClure, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 8, 1984, Ser. No. 669,566
Int. Cl.[4] G11B *5/12, 5/22*
U.S. Cl. 360—125 3 Claims



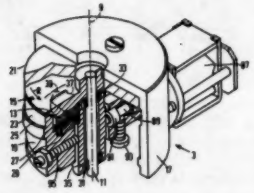
1. A thin-film slant gap magnetic head comprising a first and second substantially wedge-shaped structures which are disposed to sandwich therebetween a thin-film magnetic head structure formed on the first of said structures, said first and second structures being so disposed with respect to each other as to provide a medium-contacting surface the plan view of which is essentially rectangular, said thin-film magnetic head structure formed on the first of said wedge-shaped structures comprising an electrical coil electromagnetically coupled to said magnetic head structure, said coil having its leads extending away from said medium-contacting surface, and wherein the depth (d) of said second structure away from said medium-contacting surface is less than the depth (d') of said first structure from that surface, thereby to facilitate external coupling to the leads of said coil.

4,701,821

HELICAL SCAN TAPE RECORDER WITHOUT HEAD-TAPE CONTACT IN STAND-BY MODE

Johannes C. A. Muller, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1985, Ser. No. 769,813
Claims priority, application Netherlands, Jun. 3, 1985, 8501583
Int. Cl.[4] G11B *15/61, 5/54, 5/52*
U.S. Cl. 360—130.24 8 Claims



1. A device for magnetically recording and/or reading signals in signal tracks on a magnetic tape, comprising

a drive shaft which is rotatable about an axis of rotation,

a first means secured to the drive shaft, for carrying at least one magnetic head which is rotatable about the axis of the rotation in a circular path, and

a mounting carrying a second means, having a convex circular cylindrical guide surface whose axis extends parallel to the axis of rotation, for guiding said magnetic tape around said surface and along the magnetic head,

characterized in that one of said means is movable relative to the other means in an at least substantially radial direction between a playing position in which said guide surface is coaxial with said axis of rotation, and the rotating magnetic head is in contact with said magnetic tape which is guided by the guide surface; and a stand-by position in which said guide surface is eccentric with respect to said axis of rotation, and the rotating magnetic head is not in contact with said magnetic tape which is guided by the guide surface but is clear of said head as the head rotates, and

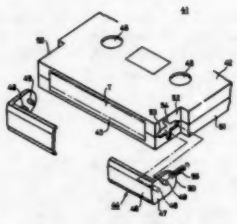
said device comprises a positioning device for accurately positioning said one means in at least said playing position.

4,701,822

MAGNETIC TAPE CASSETTE WITH GUARD PANEL

Kengo Oishi, and Osamu Suzuki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1984, Ser. No. 687,304
Claims priority, application Japan, Dec. 28, 1983, 58-199198[U]; Dec. 28, 1983, 58-199199; Jan. 4, 1984, 59-1[U]; Jan. 4, 1984, 59-2[U]; Jan. 19, 1984, 59-5613[U]; Jan. 19, 1984, 59-5616[U]
Int. Cl.[4] G11B *23/04*
U.S. Cl. 360—132 7 Claims



1. A magnetic tape cassette having a cassette case including upper and lower halves, a front wall, and laterally opposed right and left side walls, a magnetic head inserting opening in the front wall of said cassette case, said case incorporating a pair of hubs on which a magnetic tape is wound, the improvement comprising:

said cassette case having shaft-receiving holes respectively in said right and left side walls thereof, said cassette case shaft-receiving holes comprising two oppositely inclined elongated, intersecting grooves adjacent said front wall and diverging towards the front wall, said intersecting grooves terminating at their intersection, and said cassette case being provided with a guard panel for closing said opening, said guard panel being substantially U-shaped and including a front piece and right angle end pieces at opposite ends of said front piece and having two shafts fixidly mounted respectively to each of said end pieces, said shafts being engaged with said elongated holes in such a manner that said guard panel is vertically swingable about said shafts, and an elastic member connected between said guard panel and said cassette case to urge said guard panel to close said opening with said shafts positioned in a plane passing through the intersection of said intersecting grooves; and

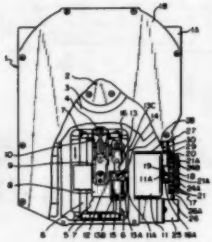
wherein the two halves of said cassette case are symmetrical in configuration.

4,701,823

MAGNETIC DISC RECORDING AND REPRODUCING DEVICE WITH DAMPER AND LOCK FOR HEAD MOVING MOTOR

Hiroshi Sakurai, Tokyo, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Oct. 17, 1985, Ser. No. 788,427
Int. Cl.[4] G11B 5/55, 21/08
U.S. Cl. 360—106 7 Claims



1. A magnetic disc recording and reproducing device comprising:

a rotatable magnetic disc;

a magnetic head for reading/writing information on the magnetic disc;

a magnetic head displacing mechanism on which said magnetic head is mounted and for displacing the magnetic head in the direction of a radius of the magnetic disc;

an electric motor having a shaft connected to said mechanism for driving said displacing mechanism;

a damper for damping the inertia force of said mechanism and the motor, said damper being connected to said shaft of said motor and having a housing which is rotatable with said shaft, and said housing having a plurality of notches on the outer circumferential surface thereof and spaced circumferentially therearound; and

lock mechanism including a pawl member spring biased toward a lock position in which said pawl member is engaged in one of the notches to block the rotation of said housing, and a solenoid for acting on said pawl member to separate it from the notch against the spring biasing force when said electric motor is energized, whereby rotation of said housing is blocked when said motor is not actuated.

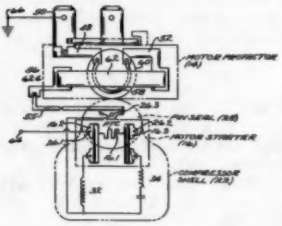
4,701,824

PROTECTED REFRIGERATOR COMPRESSOR MOTOR SYSTEMS AND MOTOR PROTECTORS THEREFOR

Louis C. Beggs, Attleboro, and John R. D'Entremont, Foxboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 4, 1985, Ser. No. 794,871
Claims priority, application Italy, Oct. 29, 1985, 47818 A/85
Int. Cl.[4] H02H 5/04, 7/085
U.S. Cl. 361—24 8 Claims

1. A motor protector for use with a compressor having a shell with three, triangularly disposed, thermally and electrically conductive pins, electrically separated from each other and from the shell, extending through the shell and electrically connected to windings of an electrical motor in the shell, the protector being adapted to be mounted on one of the pins and to permit motor starting means to be mounted on the other two pins to dispose the protector in selected thermally coupled relation to the motor through the one pin while thermally separating the protector from the motor starting means and the shell, the protector comprising a housing, current and temperature responsive switch means in the housing, a terminal for connecting the switch means in a power circuit, and a resilient, pin-receiving female clip terminal adapted to be pushed onto the one pin in pin-gripping relation thereto for thermally and electrically connecting the switch means to the motor, characterized in that the pin-receiving female terminal has an opening for axially receiving the one pin and is disposed on one side of the protector housing with the axis of the opening extending in a plane parallel to said one side of the housing in a direction from the bottom to the top of the housing, the housing is formed of a thermally and electrically insulating material, and hold-down, locating, tab means of the housing material extend



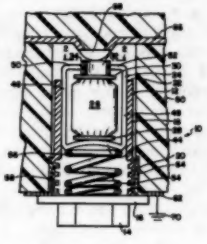
in a plane normal to said one side of the housing from said one side of the housing at the housing bottom to slidably engage each of the other pins for locating the housing in a precisely predetermined position relative to the pins to align said female terminal opening with said one pin, the tab means being relatively thin for permitting motor starting means to be mounted on the other two pins and to be accommodated over the tab means for retaining the protector in its selected location on said one pin.

4,701,825

LINE PROTECTOR

Emanuel J. Pagliuca, Patchogue, N.Y., assignor to TII Industries, Inc., Copiague, N.Y.

Filed Apr. 7, 1986, Ser. No. 848,801
Int. Cl.[4] H02H 9/06
U.S. Cl. 361—119 4 Claims



1. A line protector device for providing an electrical conducting path between a line and ground upon an overvoltage appearing on said line, comprising:

(a) an overvoltage device having a pair of longitudinally spaced apart conductive electrodes forming an arc gap therebetween, one of said electrodes including;

(i) a longitudinally outwardly extending portion, and

(ii) insulation means circumferentially disposed about said extending portion;

(b) shorting clip means longitudinally circumscribing said overvoltage device being provided with a centrally disposed slit on one end, said extending portion with said insulation means disposed upon said extending portion being positioned within said slit, said insulation means resisting the inward bias of said shorting clip means, said

insulation means permitting electrical conduction between said extending portion and said shorting clip upon overheating, the other end of said shorting clip means being shaped to increase said inward bias when urged against a surface and being in electrically conductive contact with the other overvoltage device terminal; and

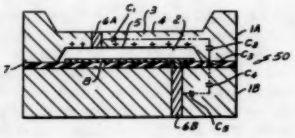
(c) hollow cartridge means being electrically conductive, said cartridge means being provided with an opening on one end adapted to receive said overvoltage device and said shorting clip means, and being in electrically conductive contact with said shorting clip means, the other end of said cartridge being externally threaded and including a cap portion.

4,701,826

HIGH TEMPERATURE PRESSURE SENSOR WITH LOW PARASITIC CAPACITANCE

Mati Mikkor, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 30, 1986, Ser. No. 924,721
Int. Cl.[4] H01G 7/00
U.S. Cl. 361—283 **1 Claim**



1. A silicon variable capacitance pressure sensor including:

a first lightly doped n (or p)-type silicon wafer having a first cavity with a first p+ (or n+) doped capacitor plate with a highly doped first p+ (or n+) semiconductor path through said first wafer contacting said first capacitance plate;

a second lightly doped n (or p)-type silicon wafer having a second p+ doped (or r+) capacitor plate with a highly doped second p+ (or n+) semiconductor path through said second wafer contacting said second capacitor plate;

an insulating layer attached to said first and second silicon wafers at a region outside the extent of said first cavity preventing electrically conductive coupling between said first and second wafers, thereby reducing parasitic capacitance between the first and semiconductor paths;

said first and second capacitor plates being highly doped semiconductor regions positioned adjacent each other and separated from each other by the depth of said cavity;

said insulating layer being formed of silicon dioxide thereby producing a structure suitable for operation at relatively high temperature; and

said first and second silicon wafers being adapted for having formed therein an integrated circuit.

4,701,827

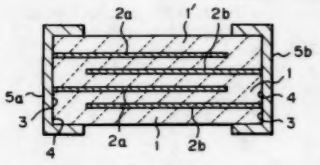
MULTILAYER CERAMIC CAPACITOR

Nobuyoshi Fujikawa, Kokubu; Syuichi Kawaminami, Hayato, and Nobuo Yokoe, Kokubu, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Feb. 10, 1986, Ser. No. 827,444
Int. Cl.[4] H01G 1/00, 4/12
U.S. Cl. 361—309 **4 Claims**

1. A multilayer ceramic capacitor comprising a laminate of units, each comprising a ceramic dielectric layer and an internal electrode, and termination electrodes arranged around said laminate and electrically connected to the internal electrodes, wherein the internal electrodes are composed of nickel and the termination electrodes are composed of a composition comprising (i) a metal component and (ii) a glass component of zinc borosilicate glass, said metal component consisting essentially of;

(a) at least one member selected from the group consisting of nickel and cobalt; and



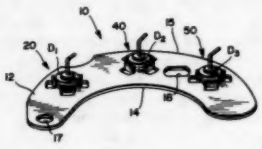
(b) copper, the weight ratio of (a) the at least one member selected from the group consisting of nickel and cobalt to (b) copper being from 95/5 to 5/95 and the volume ratio of (i) the metal component to (ii) the glass component being from 70/30 to 95.0/5.0.

4,701,828

HEAT SINK ASSEMBLY

Al Weiner, 3131 NW. 79th Ave., Miami, Fla. 33122

Continuation-in-part of Ser. No. 668,905, Nov. 7, 1984, abandoned, which is a continuation of Ser. No. 436,732, Oct. 26, 1982, abandoned. This application Apr. 28, 1986, Ser. No. 859,200
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—383 **6 Claims**



1. A heat sink mounting plate assembly for alternators, comprising:

(a) a mounting plate having good conductive characteristics which has a relatively large surface area and is adapted for mounting on an alternator and has a plurality of widely spaced flat surfaced positioning areas,

(b) a rectifying diode disposed in each of the positioning areas and having a bottom surface integrally connected to the positioning area surface in direct heat conductive contact,

(c) the periphery of the positioning areas being defined by at least two spaced relatively wide upright cooling fins which position and support the diode within the positioning area with at least one cooling fin of each positioning area being in direct supporting and heat conducting contact with the diode,

(d) the cooling fins being disposed along the outer periphery of the positioning area in contact with the side surface of the diode so as to dissipate a large proportion of the heat produced by the diode,

(e) the cooling fins being approximately one half the heighth of the diode, and being arcuately spaced from one another,

(f) a large convection opening disposed immediately adjacent each cooling fin and extending radially outward and in radial alignment therewith so as to provide a relatively large opening through which cool air may pass,

(g) sections of the mounting plate between adjacent fins and convection openings constituting a plurality of radially

outwardly extending heat conducting convection paths, and

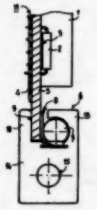
(h) the convection openings permitting cooling air to pass through the plate flowing over and thereby removing heat from the adjacent sections of the plate, the cooling fins, and the diode.

4,701,829

THERMAL CONNECTOR FOR PRINTED CIRCUIT CARD EQUIPPED WITH ELECTRONIC COMPONENTS

Herve Bricaud, Toulouse, and Dominique Bertho, Sarbrouville, both of France, assignors to Amphenol Corporation, Wallingford, Conn.

Filed Apr. 14, 1986, Ser. No. 851,646
Claims priority, application France, Apr. 16, 1985, 85 05715
Int. Cl.[4] H05K 7/20
U.S. Cl. 361—386 **14 Claims**



1. A thermal connector for a printed circuit card equipped with at least one electronic component, said card comprising a heat-conducting substrate, said connector being adapted to be mounted with similar connectors ina frame which receives a plurality of said cards, said connector comprising:

an elongated unitary block having a major axis and an upper surface including a slot extending along said axis and adapted to receive said heat-conducting substrate of said card, said slot including a vertically extending wall formed of a material which is a good heat conductor;

spring means mounted in said block adjacent to said slot and including a spring adapted to urge said heat-conducting substrate into direct contact with said wall when said card is inserted in said slot;

an internal duct extending along said axis and located beneath said slot, said duct being adapted to receive and circulate a heat-carrying fluid to serve as a heat exchanger for said card;

an entry channel extending into said block from and communicating with said duct for introducing said heat-carrying fluid into said duct; and

an evacuation channel extending into said block and communicating with said duct for evacuating said heat-carrying fluid from said duct.

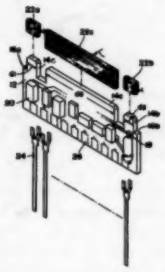
4,701,830

ELECTRONIC CIRCUIT MODULE

Noboru Kato, Shizuoka; Hideji Matsuura, Gamagori, and Shinichiro Umemura, Toyohashi, all of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,646
Claims priority, application Japan, Jan. 11, 1985, 60-2775
Int. Cl.[4] H05K 1/14
U.S. Cl. 361—395 **8 Claims**

1. An electronic circuit module comprising an elongated magnetic base plate defining only along one long side thereof a plurality of side-by-side projections extending transversely with respect to the long axis of the plate with said projections being longitudinally spaced apart to define notches between longitudinally adjacent projections, a circuit pattern formed on a surface of said magnetic base plate defining a plurality of termination areas along the opposite long side of said magnetic base plate, a circuit component connected to said circuit pattern, a plurality of lead pins each connected to a respective



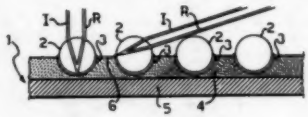
termination area of said circuit pattern for connection to an external circuit, and a plurality of coils each wound on one of said projections.

4,701,831

METHOD OF LIGHTING ENVIRONMENTS IN GENERAL, PARTICULARLY OPEN SPACE ENVIRONMENTS

Clino Trini Castelli, Via Tivoli, 8 2121 Milan, Italy

Filed Mar. 12, 1986, Ser. No. 838,843
Claims priority, application Italy, Mar. 12, 1985, 19859 A/85
Int. Cl.[4] F21S 1/02; F21V 5/00
U.S. Cl. 362—147 **5 Claims**



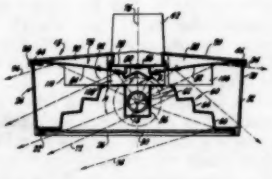
1. A method of lighting generic interiors and open-space work interiors comprising forming at least one surface of said interior as a catadioptric surface and directing at least one light beam on said catadioptric surface whereby the catadioptric surface is the lighting source for the interior.

4,701,832

LUMINAIRE FOR ROADWAY AND AREA LIGHTING

Martin L. Lasker, Edison, N.J., assignor to Prescolite, Inc., San Leandro, Calif.

Continuation-in-part of Ser. No. 664,376, Oct. 22, 1986, Pat. No. 4,651,260. This application Dec. 23, 1986, Ser. No. 945,763
Int. Cl.[4] F21V 7/00
U.S. Cl. 362—281 **3 Claims**



1. A luminaire for area lighting comprising:

a. a source of light;

b. a housing frame including a top, bottom and side portion,

said housing frame having a bottom opening and a side opening and means for supporting said source of light within said housing frame between said top and bottom of said housing frame;

c. an upper reflector system positioned between said source of light and said top of said housing frame, said upper reflector system including a first reflecting surface for reflecting light from said light source directly through said bottom opening of said housing frame, a second reflecting surface for reflecting light from said light source through said side opening of said housing frame, said second reflector surrounding said first reflector within said housing;

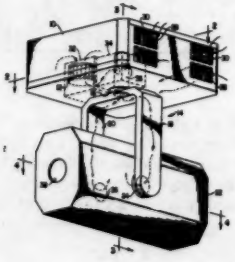
d. a lower reflector system positioned below said upper reflector system such that a gap forms between said lower reflector system and said upper reflector system to permit a substantial portion of light from said light source to pass directly to said upper reflector system through said gap only for reflection by said upper reflector system directly through said side opening in said housing frame, said lower reflector system including a reflecting surface for reflecting light from said light source directly through said bottom opening of said housing frame, said source of light projecting light directly through said bottom opening.

4,701,833

VENTILATION SYSTEM FOR STAGE LIGHT INSTRUMENT

James M. Bornhorst, Duncanville, Tex., assignor to Vari-Lite, Inc., Dallas, Tex.

Filed Jul. 16, 1986, Ser. No. 887,371
Int. Cl.[4] F21V *29/00*
U.S. Cl. 362—299 **21 Claims**



1. A stage light instrument having a lamp, comprising:

an apertured base enclosure for stationary mounting;

an apertured lamp enclosure for containing a light source;

a hollow connecting member connecting said base enclosure to said lamp enclosure;

swivel means for connecting said hollow member to said base enclosure, and for defining a bearing assembly for allowing swivel movement of said lamp enclosure about a first axis, said bearing assembly having a passage providing the communication of air from said hollow connecting member to said base enclosure;

pivotal means for connecting said hollow member to said lamp enclosure and for defining a bearing assembly allowing pivotal movement of said lamp enclosure about a second axis, said bearing assembly having a passage providing the communication of air from said hollow connecting member to said lamp enclosure; and

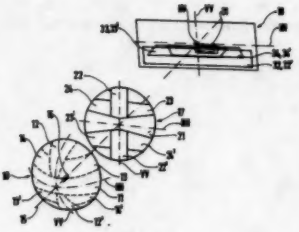
means including a fan for forcing air through said base enclosure, said connecting member, said bearing assemblies, and said lamp enclosure.

4,701,834

HEADLIGHT FOR DIM HEAD LAMPS OF MOTOR VEHICLES

Gerhard Glaser, Stuttgart; Gerhard Lindae, Leonberg; Peter Perthus, Stuttgart, and Heinz Rein, Reutlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,565
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531221
Int. Cl.[4] F21M *3/30*
U.S. Cl. 362—307 **21 Claims**



1. A headlight for dim head lamps of motor vehicles, comprising a paraboloid reflector; a glowing spiral having a cylinder axis parallel to an axis of said reflector and a hot spot in the vicinity of a focus of said reflector whereby said reflector forms light rays of said glowing spiral into a rough light beam; a transparent pane; and optical means which form from said rough light beam a dimming light beam, said transparent pane having a horizontal middle plane HH and a vertical middle plane VV, said optical means including vertically upwardly and horizontally rightwardly-deviating prisms which form only one portion (21) of said optical means on said transparent pane, said portion being positioned on said pane substantially symmetrical to said horizontal middle plan HH and said vertical middle plane VV, said portion having the height which increases from the axis of said reflector towards the edge of said transparent pane whereby said portion improves a hot spot of light intensity of the headlight.

4,701,835

MULTIMODE FLASHLIGHT

Carl J. Campagnuolo, and Asaf A. Benderly, both of Potomac, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 19, 1985, Ser. No. 777,815
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 362—192 **2 Claims**

1. A flashlight comprising:

a relatively low-speed input shaft and a relatively high-speed output shaft;

means for manually rotating said input shaft;

a ring-shaped circular spline directly coupled to said input shaft so as to rotate therewith and having a plurality of fine teeth formed on its inner surface;

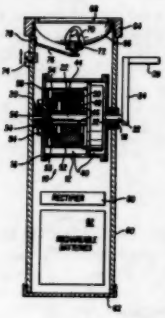
a substantially cylindrical flexspline having an end with a plurality of fine teeth formed thereon and positioned within said circular spline, the number of teeth on said flexspline different from that one said circular spline;

a wave generator positioned within said flexspline and comprising an elliptical ball-bearing assembly to which said high-speed output shaft is rigidly connected;

an alternator having rotor means and stator means, said rotor means being directly coupled to said output shaft so as to rotate therewith and said stator means positioned about said rotor means for generating electrical energy in response to rotation of said rotor means;

diode means for rectifying the electric current produced by

said alternator, said diode means having an input connected to said alternator and an output;
at least one rechargeable battery;
a parabolic reflector;
a light bulb, said light bulb mounted at the center of said parabolic reflector;
a first Zener diode;
a second Zener diode;
electric switch means for connecting said diode means output to either the lightbulb or the battery, or to both the light and the battery comprising
a first pole,



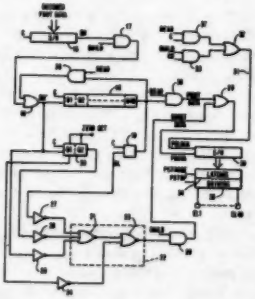
a second pole, said second pole capable of being operated independently of said first pole,
said first pole and said second pole being connected to said diode means,
a first contact, said first contact being connected to said light bulb,
a second contact, said second contact being connected to said second Zener diode,
a third contac, said third contact being connected to said first Zener diode, and
a fourth contact, said fourth contact being connected to said rechargeable battery; and a first case.

4,701,836

METHOD AND APPARATUS FOR CONTROLLING PRINT QUALITY OF A THERMAL PRINTER

Frank J. Horlander, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 793,354, Oct. 31, 1985. This application Jan. 30, 1987, Ser. No. 9,209
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **14 Claims**



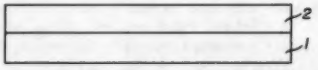
1. A method for printing characters on a recording medium with a thermal printer having means to selectively generate heat at each of a plurality of pels in a column on a thermal transfer medium during each of a plurality of cycles to print each character including:
selecting certain of the pels for heating during each cycle in accordance with a character to be printed;
determining whether the pel in the same location in the column was heated during the prior cycle or whether either of the two adjacent pels in the column is not to be heated during the same cycle;
increasing the total generated heat for a pel unless the pel at the same location in the column was heated during the prior cycle and there is to be heating of each of the two adjacent pels in the column during the same cycle;
applying heat to each of the selected pels for each cycle during one of two time periods of each cycle;
and applying heat during the other of the two time periods of each cycle to each of the selected pels to which the total heat is to be increased during the cycle.

4,701,837

LIGHT-TRANSMISSIVE RECORDING MEDIUM HAVING A CROSSLINKED-POLYMER INK RECEIVING LAYER

Mamoru Sakaki, Atsugi, and Ryuichi Arai, Sagamihara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1986, Ser. No. 833,560
Claims priority, application Japan, Mar. 4, 1985, 60-041303
Int. Cl.[4] G01D *15/34*
U.S. Cl. 346—135.1 **33 Claims**



1. A light-transmissive recording medium comprising a light transmissive substrate and an ink-receiving layer on the light transmissive substrate, said ink-receiving layer comprising a water-soluble polymer crosslinked with a crosslinking agent, and said ink-receiving layer having a water resistance meeting the standards of JIS K 5400 and an ink-receiving capacity of at least 0.2 $\mu l/cm^2$.

4,701,838

CHARACTERIZING AND HANDLING MULTI-COMPONENT SUBSTANCES

Dominicus A. Swinkels, Adamstown Heights; Peter M. Fredericks, Hamilton South, and Paul R. Osborn, Cooranbong, all of Australia, assignors to The Broken Hill Proprietary Co., Ltd., Melbourne, Australia

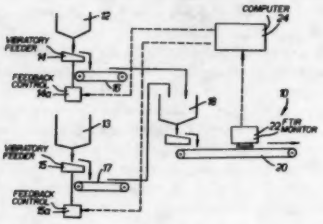
PCT No. PCT/AU84/00083, § 371 Date Dec. 26, 1984, § 102(e) Date Dec. 26, 1984, PCT Pub. No. WO84/04594, PCT Pub. Date Nov. 22, 1984
PCT Filed May 11, 1984, Ser. No. 692,886
Claims priority, application Australia, May 12, 1983, PF9312
Int. Cl.[4] G01N *21/35, 33/24*
U.S. Cl. 364—164 **15 Claims**

1. A method of handling, as bulk material, a substance which is one member of a class of multi-component substances having identifiable common properties, said method comprising:
subjecting successive test samples of said substance to a series of measurements which provide multiple data points influenced by at least one selected parameter;
calculating, from the data points, factor loadings for the respective test sample for each of multiple predetermined abstract factors;
calculating a predicted value for said at least one selected parameter for the respective test sample from said factor loadings and predetermined regression coefficients;
comparing said predicted value of said at least one selected

parameter with at least one corresponding predetermined set point;

controlling the constitution and/or disposition of said substance in response to said comparison;

wherein said regression coeeficients have been obtained by correlating known values of said at least one selected parameter for standard samples of each of multiple substances of said class with factor loadings obtained by factor analysis of multiple data points which were obtained by subjecting said standard samples to said series of measurements and wherein said abstract factors are obtained by said factor analysis.



4,701,839

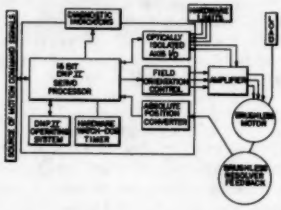
SAMPLED DATA SERVO CONTROL SYSTEM WITH FIELD ORIENTATION

Paul F. McNally, Gibsonia; Spencer W. Allen, Murrysville, and Matthew G. Cimbala, Pittsburgh, all of Pa., assignors to International Cybernetic Corporation, Pittsburgh, Pa.

Filed Nov. 9, 1984, Ser. No. 670,437

Int. Cl.[4] G05B *11/18*

U.S. Cl. 364—167 **31 Claims**



1. A sampled data system for controlling a device's motion comprising:

(a) a source of motion command signals;

(b) a command processor for processing a command representative of a desired motion of the device by generating at least one series of electrical subcommand signals, each subcommand signal representing a segment of the desired motion over a time period, said command processor being electrically connected to said source of motion command signals;

(c) a subcommand comparator electrically connected to said command processor and adapted for connection to a motion detector to compare said subcommand signals to at least one signal from said motion detector representative of the actual motion of the device and generating at least one error signal representative of a variation in a characteristic of the actual motion of the device from a corresponding characteristic of the motion represented by the subcommand signals;

(d) a motion detector for detecting a motion characteristic of the actual motion of the device and generating a signal representative of said motion characteristic electrically connected to said subcommand comparator;

(e) an error signal modifier electrically connected to said subcommand comparator so that signals can be directed in either direction to or from said modifier, said error signal modifier being adapted to output a signal to a field orientation control;

(f) a field orientation control for generating from said modified error signal at least one phase control signal to control the field orientation of the device electrically connected to said error signal modifier; and

(g) a converter for converting at least one of said phase control signals to a signal applied to the device causing the device to exhibit the desired motion, said converter electrically connected to said field orientation control and to said device.

4,701,840

SECURE DATA PROCESSING SYSTEM ARCHITECTURE

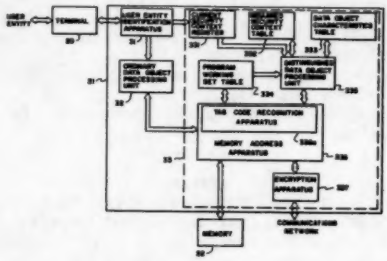
William E. Boebert, and Richard Y. Kain, both of Hennepin, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 580,910, Feb. 16, 1984, Pat. No. 4,621,321. This application Jun. 20, 1986, Ser. No. 876,540

The portion of the term of this patent subsequent to Nov. 4, 2003, has been disclaimed.

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—200 **19 Claims**



1. A data processing system for secure processing of data objects comprising:

memory means for storing ordinary data objects and distinguished data objects, a first field of each distinguished data object including a main memory location of an associated ordinary data object, a second field of said distinguished data object including access right data for said associated ordinary data object;

entry means for entering instructions by a user, said instructions having access right data associated therewith, said instructions including a operation field and a field for locating an associated ordinary data object;

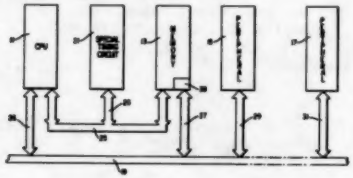
first processing means, connected to said entry means and said memory means, for processing said ordinary data objects; and

second processing means, connected to said memory means, for processing said distinguished data objects, said second processing means including means responsive to an instruction for comparing access rights associated with said instruction with access rights of said distinguished data object associated with said ordinary data object.

4,701,841
SYSTEM FOR ALTERING DATA TRANSMISSION MODES

Gerald O. Goodrich, Bellingham; Michael M. Tehranian, Acton, and Donald A. White, Westminster, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 25, 1984, Ser. No. 633,945
Int. Cl.[4] G06F *13/38*
U.S. Cl. 364—200 10 Claims



1. A data transmission system comprising

processor means for generating and outputting peripheral addresses and for exchanging data via a first data bus, said processor means further including first control means for exchanging control signals via a second data bus;

first peripheral system means, coupled to said processor means via said first data bus, for responding to a first one said peripheral addresses by exchanging said with said processor means along said first data bus at a first data rate; and

second peripheral system means, coupled to said processor means via said first and second data buses, for responding to a second one of said peripheral addresses by exchanging said data with said processor means via said first data bus at a second data rate greater than said first data rate, said second peripheral system means further including second control means for exchanging signals with said processor means via said second data bus to permit said second peripheral means to exchange said data at said second data rate.

4,701,842
METHOD AND APPARATUS FOR AVOIDING EXCESSIVE DELAY IN A PIPELINED PROCESSOR DURING THE EXECUTION OF A MICROBRANCH INSTRUCTION

Howard T. Olnowich, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1985, Ser. No. 784,073
Int. Cl.[4] G06F *9/22*
U.S. Cl. 364—200 6 Claims

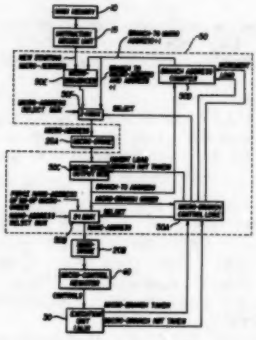
1. A pipelined instruction execution system, comprising:

first store means for storing sets of sequential addresses;

second store means connected to said first store means for storing a plurality of microinstructions and a no-op microinstruction, each microinstruction corresponding to an address stored in said first store means;

execution means connected to the second store means for executing a set of microinstructions stored in said second store means in a sequential fashion in accordance with the addresses stored in said first store means and for executing said no-op microinstruction; and

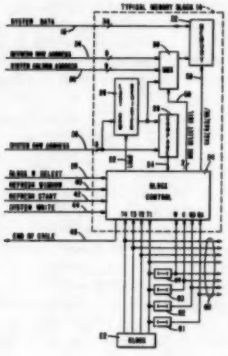
first means interconnected between the first and second store means for preventing a microinstruction address from said first store means from accessing said second store means for the purpose of searching for a microinstruction stored therein and for accessing said second store means with an address indicative of said no-op microinstruction when said execution means is executing a conditional branch microinstruction.



4,701,843
REFRESH SYSTEM FOR A PAGE ADDRESSABLE MEMORY

Morris Cohen, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 1, 1985, Ser. No. 718,764
Int. Cl.[4] G06F *12/16*
U.S. Cl. 364—200 11 Claims



1. A computer memory subsystem comprising:

a memory subsystem controller having means for providing a plurality of block select signals;

row address means in said memory subsystem controller for providing a row address;

a plurality of memory blocks, one for each of the block select signals provided by said memory subsystem controller;

an input in each of said memory blocks connected to said memory subsystem controller for receiving one of said block select signals;

random access memory (RAM) devices in each of said memory blocks for storing data;

a refresh means in each of said memory blocks connected between said input and said RAM devices of its memory block for refreshing its connected RAM devices indepen-

dent of the refreshing of the RAM devices of other blocks, the refreshing of said refresh means to occur when the associated memory block is not selected by its corresponding block select signal from said memory subsystem controller;

last row means in each of said memory blocks connected to said row address means for storing the last row address received from said memory subsystem controller before refreshing by said refresh means; and

re-establish means in each of said memory blocks connected between said last row means and said RAM devices for re-establishing said last row address in its associated RAM devices after said associated RAM devices are refreshed.

4,701,844

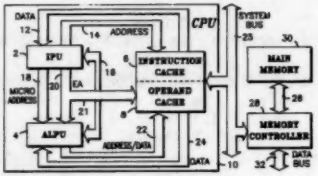
DUAL CACHE FOR INDEPENDENT PREFETCH AND EXECUTION UNITS

Richard F. Thompson, Santa Clara; Daniel J. Disney, Felton; Swee-meng Quek, San Jose, and Eric C. Westerfeld, Milpitis, all of Calif., assignors to Motorola Computer Systems, Inc., Cupertino, Calif.

Continuation of Ser. No. 595,176, Mar. 30, 1984, abandoned. This application Oct. 16, 1986, Ser. No. 918,667

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—200 **1 Claim**



1. A digital computing system comprising:

a main memory unit for storing at addressable locations thereof blocks of information, including instructions and operands, useable in said system; and

a central processing unit for fetching and executing instructions comprising:

an instruction prefetch unit for fetching said instructions;

an arithmetic logic processing unit for executing said instructions;

an instruction cache memory unit for storing blocks of said information, said instruction cache memory unit including first means coupled to said instruction prefetch unit for determining whether an instruction sought by said instruction prefetch unit is contained in said instruction cache memory unit, said first means also being coupled to said arithmetic logic processing unit for generating a first signal if information to be written by said arithmetic logic processing unit into said main memory unit is contained in said instruction cache memory unit; and

an operand cache memory unit for storing blocks of said information, said operand cache memory unit including second means coupled to said arithmetic logic processing unit for determining whether an operand sought by said arithmetic logic processing unit is contained in said operand cache memory unit, said second means also being coupled to said arithmetic logic processing unit for generating a second signal if information to by written by said arithmetic logic processing unit into said main memory unit is contained in said operand cache memory unit;

means enabling said arithmetic logic processing unit to write information simultaneously into said main memory unit and into said instruction cache memory unit in response to said first signal; and

means enabling said arithmetic logic processing unit to write information simultaneously into said main memory and into said operand cache memory unit in response to said second signal.

4,701,845

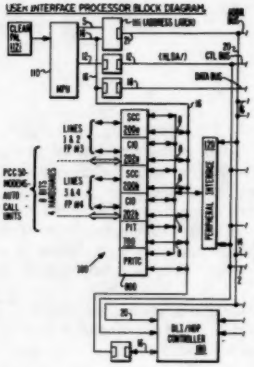
USER INTERFACE PROCESSOR FOR COMPUTER NETWORK WITH MAINTENANCE AND PROGRAMMABLE INTERRUPT CAPABILITY

David A. Andreasen, Newtown Square, Pa.; Jerrold E. Buggert, San Juan Capistrano, Calif.; Harshad K. Desai, Mission Viejo, Calif., and Zubair Hussain, Sunnyvale, Calif., assignors to Unisys Corporation, Detroit, Mich.

Filed Oct. 25, 1984, Ser. No. 664,896

Int. Cl.[4] G06F *11/22, 13/34*

U.S. Cl. 364—200 **11 Claims**



1. In a computer network having a host computer and input-/output (I/O) subsystem connected to peripheral units via data link processors (I/O controllers), a User Interface Processor for support and maintenance operations, and for dual functional operations in data transfers between itself and said host computer and between itself and said data link processors via a host dependent port (HDP) data link transfer interface, said User Interface Processor operating to initialize and power-up said network and operating to initiate self-testing procedures for purposes of confirming system integrity and locating any faults, said user interface processor comprising:

(a) a microprocessor subsystem including:

(a1) microprocessor means for executing instructions and maintenance data transfer operations, said microprocesor means connected to memory means, to a plurality of serial communication controllers, to a plurality of I/O port means, and to a programmable priority interrupt controller;

(a2) said memory means including:

(a2a) programmable read only memory means for storing firmware instruction data;

(a2b) random access memory means for temporary storage of code for effecting initialization and maintenance routines;

(a3) said plurality of serial communications controllers providing serial data channels for data communication lines to a first set of external units, said serial communications controllers operable for driving programmable interrupt vectors;

(a4) said plurality of I/O port means for bidirectional parallel data transfer connections to a second set of external units, at least one of said I/O port means capable of pattern recognition and generation of an interrupt upon recognition of a specific pattern;

(a5) programmable priority interrupt controller means,

connected to said microprocessor means, for receiving and prioritizing interrupt signals from said serial communications controllers, from said I/O port means and from a plurality of programmable interval timers and including:

(a5a) means to output a vector data signal to said microprocessor means for selecting a service routine dependent on the source of said interrupt signal;

(a6) said plurality of programmable interval timers for receiving instruction data from said microprocessor means and for providing programmed time-interval signals to said priority interrupt controller means;

(b) a dual function controller means connected to said microprocessor means, to said serial communications controllers, to said I/O port means, and to said priority interrupt controller means, said dual function controller providing an interface for data transfers via said data link transfer interface and including:

(b1) means to execute transfer operations as a master via said data link transfer interface to said data link processors, said user interface processor operating to send commands to initiate a data link processor self-test routine; and

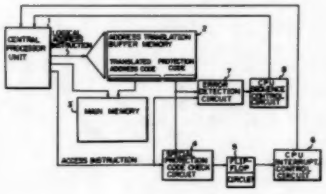
(b2) means to execute data transfer operations to said host computer as a slave of said data link transfer interface, said data transfer being executed as a specifically oriented message level interface protocol to continuously provide maintenance and/or information data transfers between the user interface processor and host computer.

4,701,846

COMPUTER SYSTEM CAPABLE OF INTERRUPTION USING SPECIAL PROTECTION CODE FOR WRITE INTERRUPTION REGION OF MEMORY DEVICE

Kazuhiko Ikeda, Yokohama, and Makoto Kawamura, Tokyo, both of Japan, assignors to Panafacom Limited, Kanagawa, Japan

Filed Jan. 17, 1986, Ser. No. 819,787
Claims priority, application Japan, Jan. 19, 1985, 60-008076
Int. Cl.[4] G06F 9/46
U.S. Cl. 364—200 **2 Claims**



1. A computer system comprising:

a central processor unit;

a main memory having a stack region device connected to said central processor unit;

a subsidiary memory device connected to said central processor unit and said main memory device for delivering a translated real address and protection codes including ordinary protection codes and a special protection code;

an error detection means responsive to said ordinary protection codes from said subsidiary memory device and an access instruction from said central processor unit for checking said ordinary protection codes; and

a special protection code check means responsive to said special protection code from said subsidiary memory device and an access instruction from said central processor unit for checking said special protection code;

error detection in said error detection means being carried out when said ordinary protection codes from said subsidiary memory device do not coincide with said access instruction from said central processor unit;

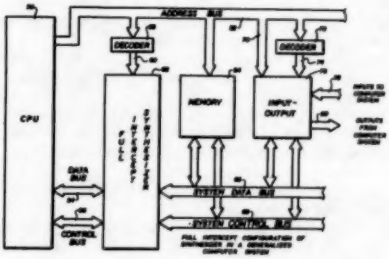
checking of said special protection code in said special protection code check means being carried out when said special protection code from said subsidiary memory device is present and said access instruction from said central processor unit is a write instruction, whereby writing into a region beyond said stack region in said main memory device is possible and the information of execution of the write operation to said region beyond said stack region in said main memory device is transmitted to said central processor unit.

4,701,847

ADAPTIVE INSTRUCTION SEQUENCE SYNTHESIZER AND PROCESS

John L. Nichols, Santa Clara, Calif., assignor to Logical Services, Inc., Santa Clara, Calif.

Filed Jan. 9, 1985, Ser. No. 689,836
Int. Cl.[4] G06F 9/00
U.S. Cl. 364—200 **13 Claims**



1. An adaptive instruction generator for use in a computer system having a central processing unit (CPU), random access memory (RAM), a system bus including an address bus, data bus and control bus, all coupled to said instruction generator, comprising:

a startup decoder coupled to said system bus,

said startup decoder generating a startup signal when a predefined startup signal pattern is detected;

state means for denoting the current state of said adaptive instruction generator;

data processing means, coupled to said data bus, for generating one or more synthesized data values, including means for generating data values corresponding to data received from said data bus;

state updating means for responding to said startup signal by causing said state means to denote an active state, and for generating a new current state in accordance with the previous current state and said synthesized data values;

instruction generating means responsive to memory access signals from said CPU on said control bus when said state means denote an active state, for generating and transmitting onto said data bus instructions to be used by said CPU, including means for generating instructions corresponding to said current state of said adaptive instruction generator and said synthesized data values generated by said data processing means; and

deactivation means for deactivating said instruction generation means when said state means denotes a preseelcted inactive state;

whereby said adaptive instruction generator can

perform data processing operations that would otherwise be performed by said CPU, and

produce instructions for execution by said CPU based on the results of said data processing operations, thereby reduc-

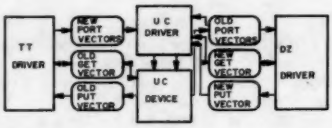
ing the number of instructions executed by said CPU to perform a predefined task.

4,701,848

SYSTEM FOR EFFECTIVELY PARALLELING COMPUTER TERMINAL DEVICES

Robert A. Clyde, Orem, Utah, assignor to Clyde, Inc., Orem, Utah

Filed Nov. 19, 1984, Ser. No. 673,128
Int. Cl.[4] G06F *9/00, 11/00*
U.S. Cl. 364—300 **50 Claims**



1. A method of controlling the movement of data between a first driver program and a second driver program, the first and second driver programs included in an operating system for a digital computing system, the method comprising the steps of:

generating a third driver program;

identifying an original set of vectors used by the first and second driver programs to establish a communication link between each other;

generating a new set of vectors to establish communication links between (a) the first driver program and the third driver program and (b) the second device driver program and the third driver program;

inserting the new set of vectors in the locations of the original set of vectors; and

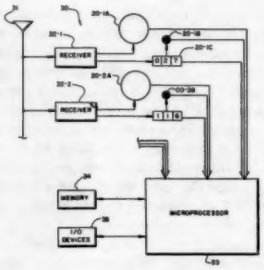
communicating data between the first and third device driver programs and between the second and third driver programs by way of the communication links established by the insertion of the new set of vectors such that all data passing between the first and second driver programs flows through the third driver program, the flow of data being controlled by the third driver program.

4,701,849

SYSTEM FOR SUMMONING SERVICE PERSONNEL AND MONITORING THEIR RESPONSE TIME

Michael G. Elden, 1405 Curlew Ave., Naples, Fla. 33962

Filed Mar. 7, 1986, Ser. No. 837,597
Int. Cl.[4] G06F *3/04, 15/24*
U.S. Cl. 364—401 **4 Claims**



1. A system for summoning service personnel and monitoring their response time in a facility having a plurality of tables at which customers are located comprising:

an electromagnetic signal transmitter located at each table, each of said transmitters including switch means operable by a customer requesting service to selectively activate that transmitter so as to generate a signal which is unique to that particular table;

a central station located within the facility having a plurality of individual sections therein, each of said individual sections corresponding to a particular table in the facility and including a visual indicator and an audible annunciator and a timer;

receiver means disposed within said central station and responsive to the generation of said unique signals from each of said tables for activating the visual indicator of the individual section corresponding to a particular table whose transmitter has been activated by a customer requesting service and for resetting the timer of said corresponding individual section to zero and subsequently activating said timer to count upwardly at a predetermined rate, said receiver means being adapted to deactivate said visual indicator and said audible annunciator and said timer when the receiver ceases receiving the signal unique to that particular individual section of the central station, and

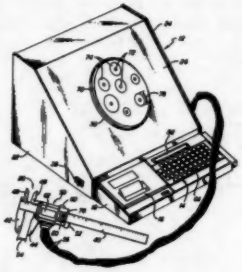
a microprocessor connected to the visual indicators, the audible annunciators and the timers of the central station to store and compile the data generated by the central station.

4,701,850

METHOD AND APPARATUS UTILIZING AGAR DIFFUSION TECHNIQUE FOR DETERMINING QUANTITATIVE DRUG CONCENTRATION PARAMETER

David L. Gibbs, 250 Mercer St., A301, New York, N.Y. 10012

Filed Jun. 26, 1985, Ser. No. 749,006
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—415 **29 Claims**



1. A medical testing apparatus utilizable with an agar diffusion technique for determining a quantitative drug concentration parameter related to the size of a bacteria-growth inhibition zone, wherein said zone surrounds a drug-carrying receptacle in communication with a nutrient medium bearing a bacteria culture, said apparatus comprising in combination:

distance measuring means for measuring a linear dimension of the bacteria-growth inhibition zone and for generating a signal coding the measured value of said linear dimension;

computing means for automatically calculating, in response to said signal, the quantitative drug concentration parameter; and

coupling means for operatively connecting said distance measuring means to said computing means to enable automatic transmission of said signal to said computing means, said distance measuring means being provided with means including a manually actuatable switch for inducing trans-

mission of said signal over said coupling means to said computing means.

4,701,851

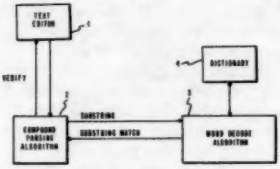
COMPOUND WORD SPELLING VERIFICATION

Vance R. Bass, Austin; Veronica A. Bonebrake, Leander; David A. Garrison; James K. Landis, both of Austin, all of Tex.; Mary S. Neff, Montrose, N.Y.; Robert J. Urquhart, and Susan C. Williams, both of Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 24, 1984, Ser. No. 664,183

Int. Cl.[4] **G06F** *15/38;* **G06G** *7/60*

U.S. Cl. 364—419 **9 Claims**



1. In a computer system including a dictionary against which text words are compared for spelling verification, a method of verifying the spelling of an input text compound word which word is not stored in said dictionary, comprising:

identifying a longest dictionary word which is an initial substring of said compound word;

determining a first remainder of said compound word which consists of that portion of said compound word succeeding said initial substring;

comparing said first remainder with said dictionary; and

signaling that said compound word is correctly spelled if said first remainder is found in said dictionary.

4,701,852

METHOD AND DEVICE FOR SIGNALING THAT GEAR CHANGE IS REQUIRED

Stefan Ulveland, Gothenburg, Sweden, assignor to AB Volvo, Gothenburg, Sweden

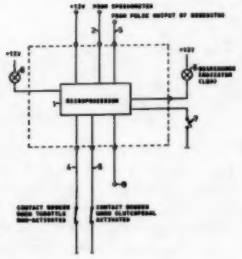
PCT No. PCT/SE83/00425, § 371 Date Aug. 2, 1984, § 102(e) Date Aug. 2, 1984, PCT Pub. No. WO84/02311, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 2, 1983, Ser. No. 638,841

Claims priority, application Sweden, Dec. 6, 1982, 8206956

Int. Cl.[4] **B60K** *20/08,* ⁄*1/06;* **G06F** *15/20*

U.S. Cl. 364—424.1 **12 Claims**



1. A device for signaling a motor vehicle operator to change gear ratios of a gear box connected to an engine of a motor vehicle comprising:

a tachometer for determining the engine rotational speed;

a computing unit connected to receive a measured speed of said motor vehicle and said tachometer measured engine rotational speed, and to determine said selected gear ratio, said computing unit storing a plurality of factors for each of said gear ratios representing the ratio of each gear ratio with the next highest gear ratio and multiplying one of said stored factors corresponding to said selected gear ratio with said rotational speed to determine the rotational speed of said engine if the next highest gear ratio is selected; said computing unit generating a gear ratio change signal when said determined rotational speed at said next higher gear ratio exceeds a predetermined minimum, and a signal indicator for receiving said gear ratio change signal for identifying a gear ratio change.

10. A method for signaling a motor vehicle operator to change gear ratios comprising:

measuring the rotational speed of an engine of said motor vehicle engine by detecting pulses from a generator which is belt driven by said motor vehicle engine;

determining which of said gear ratios is selected;

multiplying the measured rotational speed of said engine with a value representing the ratio of said selected gear ratio and the next highest gear ratio, whereby a rotational speed of said engine for said next higher gear ratio is determined;

comparing said next highest gear ratio rotational speed with a predetermined level; and

signaling said operator to change gears when said next highest gear ratio rotational speed exceeds said predetermined level.

4,701,853

CONTROL DEVICE IN CONTINUOUSLY VARIABLE TRANSMISSION SYSTEM FOR VEHICLE

Akinori Osanai, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 31, 1985, Ser. No. 739,615

Claims priority, application Japan, Jun. 6, 1984, 59-114508

Int. Cl.[4] **G05D** *17/02;* **B60K** *41/14*

U.S. Cl. 364—424.1 **14 Claims**

1. A control device in a continuously variable transmission system for a vehicle, wherein said continuously variable transmission system is provided on a power transmission route of an engine and a speed ratio thereof is controlled such that an engine rotational speed can be a target engine rotational speed, comprising:

throttle opening sensor means;

rotation angle sensor means; and

processor means including:

(a) an acceleration requirement detecting means for detecting a requirement for an acceleration of the vehicle;

(b) a deceleration requirement detecting means for detecting a requirement for a deceleration of the vehicle;

(c) an acceleration detecting means for detecting an acceleration of the vehicle;

(d) a deceleration detecting means for detecting a deceleration of the vehicle;

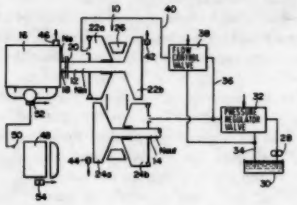
(e) a first comparing means for comparing a detected acceleration with a reference acceleration;

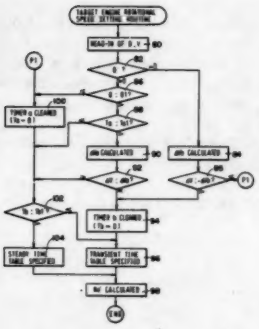
(f) a second comparing means for comparing a detected deceleration with a reference deceleration;

(g) a selecting means for selecting a steady time target engine rotational speed or a transient time target engine rotational speed as a target engine rotational speed; and

(h) a control means for selecting a transient time target engine rotational speed when a detected acceleration

during acceleration is smaller in value than the reference acceleration or a detected deceleration during





deceleration is smaller in value than the reference deceleration.

4,701,854

METHOD AND SYSTEM FOR PERFORMING FAIL-SAFE OPERATION FOR ANTI-SKID AUTOMOTIVE BRAKE CONTROL SYSTEM HAVING A PLURALITY OF CONTROLLERS INDEPENDENTLY OPERABLE TO OTHERS

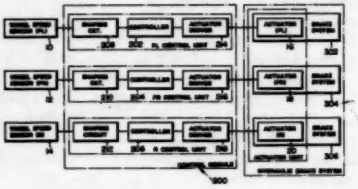
Toshiro Matsuda, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 13, 1985, Ser. No. 701,349

Claims priority, application Japan, Feb. 13, 1984, 59-22952

Int. Cl.[4] G06F *15/00*; B60T *8/32*

U.S. Cl. 364—426 **14 Claims**



1. In an anti-skid brake control system for an automotive vehicle including a plurality of mutually independent control sub-systems for controlling braking operations of respectively corresponding braking circuits, each of said control sub-systems including a pressure control valve operable among a first position in which braking pressure in the corresponding brake circuit is increased, a second position in which the braking pressure in said corresponding braking circuit is decreased and a third position in which the braking pressure in said corresponding braking circuit is held constant, an actuator connected to said pressure control valve to operate the latter according to a control signal, a wheel speed sensor producing a sensor signal indicative of rotation speed of a corresponding vehicular wheel, and a controller receiving said sensor signal for deriving said control signal on the basis thereof,

a method for performing a fail-safe operation when failure of operation in one of the control sub-systems is detected, comprising the steps of:

monitoring operation of each of said control sub-systems for detecting a malfunctioning control sub-system, disabling said actuator of said malfunctioning control sub-system and maintaining said corresponding control signal at a value indicative of said first position of said pressure control valve thereby allowing a manual mode of operation, and producing a fault-indicative signal; and

monitoring operating conditions of other control sub-systems by checking the presence of said fault indicative signal, and performing a fail-safe operation by disabling said actuator of other malfunctioning control sub-systems and holding, to corresponding control signal at a value corresponding to said first position and producing other fault-indicative signals corresponding to the other control sub-systems.

4,701,855

METHOD AND CIRCUIT CONFIGURATION FOR SUPPRESSING UNDESIRED CONTROL ACTIONS IN SLIP-CONTROLLED BRAKE SYSTEMS

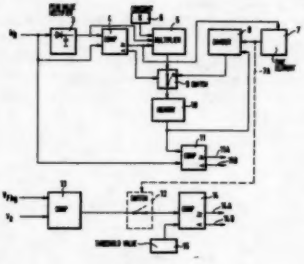
Helmut Fennel, Bad Soden, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 5, 1984, Ser. No. 678,252

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345729

Int. Cl.[4] B60T *8/32*

U.S. Cl. 364—426 **19 Claims**



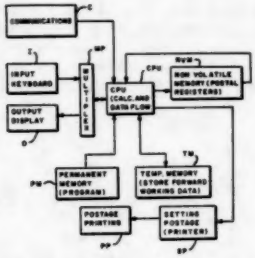
1. A method for suppressing undesired control actions in slip-controlled brake systems for vehicals having wheels, which control actions are caused by oscillations of the undercarriage or the axle of said vehicle, wherein the method determines the wheel rotational behavior and controls the braking pressure of said brake systems wherein the controlled wheel decelerates and re-accelerates during the application of braking pressure as a function of accleration criteria and which initiates slip control of a wheel when predetermined acceleration threshold values are exceeded, wherein said method includes the step of varying a threshold value required for initiation of the control as a function of the re-acceleration of the controlled wheel of said vehicle.

4,701,856

RESET DELAY CIRCUIT FOR AN ELECTRONIC POSTAGE METER

Peter C. DiGiulio, Easton, Conn.; Warren G. Hafner, Lake Carmel, N.Y., and Henry Stalzer, Danbury, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 12, 1985, Ser. No. 710,874
Int. Cl.[4] G06F *15/20*; G06G *7/48*
U.S. Cl. 364—466 5 Claims



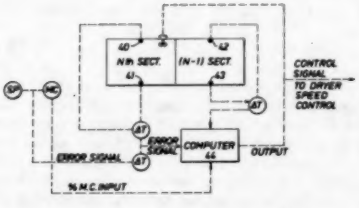
1. In an electronic postage meter which includes a processing means, a memory means operatively connected to the processing means, a system clock and a printer, the postage meter also having means for providing input signals which indicate a satisfactory regulated voltage level and satisfactory unregulated voltage level and a satisfactory clock frequency, means operatively connected to the processing means for providing a reset delay signal to the processing means and also for providing control signals to the memory means and the printer, said means for providing the reset delay signal comprising logic gate means receiving the input signals from the meter, a reset counting means having first and second inputs and an output, the first input of the reset counting means being operatively connected to the output of the logic gate means, the second input of the reset counting means being operatively connected to the system clock, the counting means being responsive to the signals supplied at the first and second inputs for providing a signal to the postage meter to allow the printer to be enabled if the input signals from the postage meter are at the appropriate levels and to disable the printer otherwise.

4,701,857

METHOD AND APPARATUS FOR CONTROLLING DRYERS FOR WOOD PRODUCTS, FABRICS, PAPER AND PULP

John W. Robinson, 108 Cypress St., Silsbee, Tex. 77656

Filed Jan. 25, 1984, Ser. No. 573,696
Int. Cl.[4] F26B *21/10, 21/12*
U.S. Cl. 364—477 10 Claims



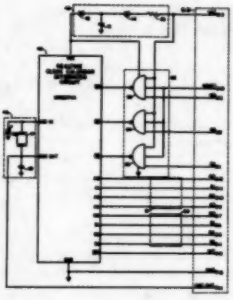
1. A method of drying a product to a desired final moisture content in which the product being dried moves through the dryer at an adjustable speed while being contacted by a drying medium comprising the steps of moving the product through the dryer, measuring at a location in the dryer a differential temperature, (ΔT), that relates to the difference between the temperature of the drying medium and that of the product to determine at that time and at the speed of the dryer at that time what the final moisture content of the product will be, and controlling the equilibrium value of ΔT by varying one of the components of ΔT and the speed of the product through the dryer to obtain the desired final moisture content in the product.

4,701,858

NONVOLATILE REALTIME CLOCK CALENDAR MODULE

John H. Stokes; John I. Clark; James D. Morris, and Steven M. Ward, all of Las Cruces, N. Mex., assignors to Energy Optics Inc., Las Cruces, N. Mex.

Filed Dec. 31, 1984, Ser. No. 688,035
Int. Cl.[4] G08B *23/00*; G11C *8/00*
U.S. Cl. 364—483 9 Claims



1. A nonvolatile realtime clock calendar circuit module, including a secondary power source, for use in a microcomputer based time-of-use utility meter system deriving power from a primary power source, comprising:

semi-conductor chip integrated circuit clock means for computation of realtime clock calendar information, including input and output means for connection to the system for transfer of data between said integrated circuit clock means and said system;

protected read/write logic circuit means connected to said integrated circuit clock means for selectively enabling said integrated circuit clock means to prevent said transfer of data when said data is undesired or degraded due to primary power source outage or transient, said protected read/write logic circuit means being responsive to qualifying digital voltage states of said primary power source and a RESET signal, before said integrated circuit clock means can be read from or written to;

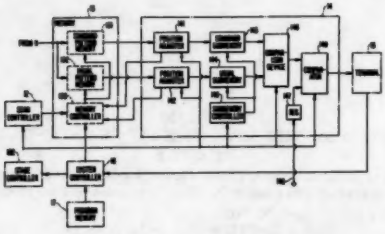
time reference means connected to said integrated circuit clock means providing a precise counting reference for realtime computation;

a rechargeable capacitor connected to said integrated circuit clock means effective to provide sufficient power to said integrated circuit clock means to sustain valid realtime computation for a period exceeding twelve (12) hours when power from the primary power source of the system is not available.

4,701,859
INSPECTING METHOD AND APPARATUS FOR A PHOTOMASK PATTERN

Takayoshi Matsuyama, Kawasaki, and Kenichi Kobayashi, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 10, 1984, Ser. No. 659,425
Claims priority, application Japan, Oct. 13, 1983, 58-191618
Int. Cl.[4] G06F *15/60;* G06K *9/68;* G01B *11/00;* H04N *7/18*
U.S. Cl. 364—490 10 Claims



10. A mask inspecting apparatus for inspecting a mask, comprising:

means for designating a standard pattern in groups of combined patterns on the mask;

a stage for mounting and shifting the mask to be inspected;

a stage controller, connected to said stage, for shifting said stage in a step and repeat type movement in latitudinal and longitudinal directions;

optical means for producing, one at a time, an optical image of each combined pattern in each group from the mask on the stage;

image sensing means, connected to said optical means, for scanning and converting the optical image into electric signals;

scan controller means, connected to said stage controller and said image sensing means, for controlling the scanning and for producing address signals for the optical image in correspondence with the converted electric signals;

memory means, connected to said scan controller means and including first and second memories, for dividing the converted electric signals into first signals for said standard pattern and second signals for another combined pattern in said group and for storing the first signals in the first memory and the second signals in the second memory;

means for comparing the first and second signals read out from the respective first and second memories;

means for providing an amount of difference for each comparison;

means for providing an allowance level for the difference;

means for indicating the arrangement of the unit patterns is correct or incorrect in dependance upon a comparison of the amount of difference with the allowance level; and

means for executing sequentially, comparisons for each group of combined patterns.

4,701,860
INTEGRATED CIRCUIT ARCHITECTURE FORMED OF PARAMETRIC MACRO-CELLS

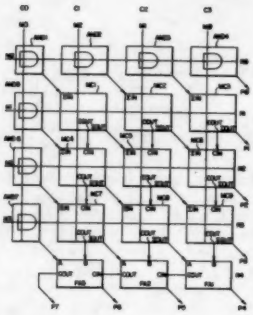
James M. Mader, Indialantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 7, 1985, Ser. No. 709,138
Int. Cl.[4] G06F *15/60;* H03K *3/26*
U.S. Cl. 364—490 10 Claims

1. A method of manufacturing an integrated circuit comprising the steps of:

(a) storing a first library of a first plurality of different prescribed function-performing digital logic circuit devices of a first signal processing capacity capable of being implemented within said integrated circuit;

(b) storing a second library of a second plurality of different prescribed function-performing digital signal processing devices of a second signal processing capacity greater than said first signal processing capacity and capable of being implemented within said integrated circuit by combinations of the digital logic circuit devices of said first library, prescribed characteristics of said second plurality of different prescribed function-performing digital signal processing devices being individually selectable, so that the signal processing function of a respective one of said second plurality of digital signal processing devices is established by a respective combination of plural ones of said first digital logic devices, thereby providing a respective signal processing device having said second signal processing capacity;



(c) configuring said integrated circuit in the form of an interconnected arrangement of selected ones of the digital signal processing devices of said second library, prescribed characteristics of which are selected based upon signal processing parameters of said integrated circuit;

(d) configuring said selected ones of the digital signal processing devices of said second library of respective combinations of selected ones of the digital logic circuit devices of said first library; and

(e) forming an interconnected architecture of the selected ones of the digital signal processing devices of said second library as configured in step (d) in a body of semiconductor material, whereby a semiconductor chip architecture of said integrated circuit is realized.

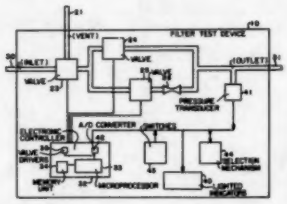
4,701,861
FILTER TEST DEVICE

Heinz Kauke, Erlensee, Fed. Rep. of Germany, assignor to Pall Corporation, Glen Cove, N.Y.

Filed May 31, 1985, Ser. No. 739,445
Int. Cl.[4] G01M *3/20*
U.S. Cl. 364—502 6 Claims

1. In an arrangement which test the integrity of one of a plurality of filter systems according to one of a plurality of sets of parameters wherein the arrangement includes a source of pressurized gas, each filter system includes a filter vessel containing at least one filter element between an inlet and an outlet, and each set of parameters corresponds to a respective filter system, a filter test device comprising an inlet communicating with the gas source, an outlet communicating with the inlet of the filter vessel, valve means disposed between the inlet and the outlet of the filter test device for regulating the flow of gas from the gas source to the filter vessel, circuit means for controlling the valve means in accordance with one of the sets of parameters, said circuit means including a memory means

for storing the plurality of sets of parameters, and means communicating with the circuit means for selecting said one set of



parameters whereby the circuit means controls the valve means in accordance with the set of parameters corresponding to the filter element contained in the filter system.

4,701,862

AUDIO OUTPUT DEVICE WITH SPEECH SYNTHESIS TECHNIQUE

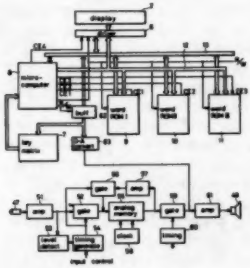
Isamu Washizuka, Kyoto; Kosuke Nishimura, Yamatokoriyama, and Mitsuhiro Saiji, Kyoto, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 296,546, Aug. 26, 1981, abandoned. This application May 27, 1986, Ser. No. 867,603

Claims priority, application Japan, Aug. 27, 1980, 55-118649

Int. Cl.[4] G10L *5/00*

U.S. Cl. 364—513.5 **2 Claims**



1. A method for producing an audible message with an alarm clock, comprising the steps of:

inputting an alarm time into an alarm time register using a plurality of input keys;

inputting voice sounds into the alarm clock through microphone means developing a voice sound signal;

storing said voice sounds as an alarm message by,

developing a first timing signal,

gating the voice sound signal into gated signal portions in synchronism with the first timing signal,

introducing each said gated signal portions into an analog semiconductor memory operatively connected to said microphone means for storage therein, and

shifting said gated signal portions through said analog memory in synchronism with the first timing signal to store gated signal portions corresponding to said voice signal;

monitoring a passing of time using a clocking device to produce a signal indicative of actual time;

comparing said signal indicative of actual time to said alarm time stored in said alarm register;

producing an alarm signal when said comparing step indicates that said actual time is equal to said alarm time; and

outputting a voice message when said alarm signal is produced, said voice message when said alarm signal is produced, said voice message including an audible announcement of the actual time and an audible announcement of said alarm message stored in said alarm information memory, said alarm message being output by,

developing a second timing signal,

circularly shifting said gated signal portions in said analog semiconductor memory in synchronism with the second timing signal,

monitoring an output of said analog semiconductor memory during said step of circularly shifting to recreate said voice sound signal, and

supplying said voice sound signal to a speaker to audibly announce said alarm message.

4,701,863

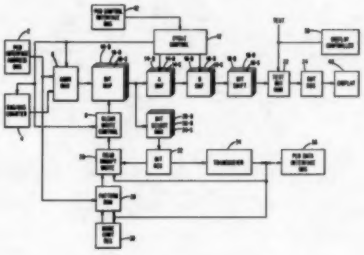
APPARATUS FOR DISTORTION FREE CLEARING OF A DISPLAY DURING A SINGLE FRAME TIME

Kenneth E. Bruce, Nashua, N.H., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 14, 1984, Ser. No. 681,537

Int. Cl.[4] G06F *15/62;* **G09G** *1/16*

U.S. Cl. 364—518 **6 Claims**



1. A color graphics display system includes a color display, a plurality of bit map memories for storing bits representative of an image displayed on said color display, and a clearing apparatus for clearing said image, said clearing apparatus comprising:

bus means for receiving a data signal and a plurality of control signals for indicating a clear operation;

counting means coupled to said bus means and responsive to a first control signal for counting the number of horizontal scan lines forming said image and generating a first occurrence of a vertical synchronization signal when said counting means indicates a predetermined count corresponding to the end of a raster scan;

clear cycle means coupled to said bus means and said counting means and responsive to the vertical synchronization signal and a second control signal to generate a clear cycle signal in a first state indicating the start of a clear image cycle;

memory addressing means coupled to said counting means and responsive to a sequence of count signals generated by said counting means for generating a sequence of address signals for addressing the bit map memories during a display cycle for reading the bits representative of an image displayed to the color display; and

write memory means coupled to said clear cycle means and said memory addressing means and responsive to said clear cycle signal and said sequence of address signals for writing binary ZERO bits in each location of said plurality of bit map memories specified by said sequence of address signals during a display cycle;

said clear cycle means being responsive to a second occurrence of said vertical synchronization signal for generat-

ing said clear cycle signal in a second state thereby indicating the end of said clear image cycle at the end of a display cycle.

4,701,864

MEMORY CONTROL APPARATUS FOR A CRT CONTROLLER

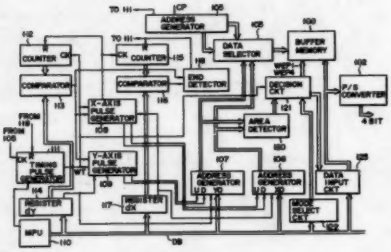
Shigekazu Takashima, Yokohama, and Tsutomu Sakamoto, Yokosuka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 26, 1985, Ser. No. 716,135

Claims priority, application Japan, Mar. 28, 1984, 59-60212; Sep. 27, 1984, 59-202706; Dec. 27, 1984, 59-274032

Int. Cl.[4] G06F *3/14*

U.S. Cl. 364—521 **11 Claims**



1. A memory control apparatus for a CRT controller comprising:

a buffer memory including a plurality of X and Y addresses which are each designated by address data, said X and Y addresses respectively defining horizontal and vertical positions in X and Y coordinates on a CRT screen;

a data input circuit for supplying drawing data to said buffer memory;

write pulse generating means for producing a write pulse for enabling said buffer memory to store said drawing data; and

means for updating said address data, including:

(a) initial means for producing initial X and Y addresses Xo and Yo, respectively, which represent initial values of respective X and Y addresses;

(b) X address updating means, initialized by said initial means, for updating the initial X address while the Y address is fixed;

(c) Y address updating means, initialized by said initial means, for updating the initial Y address while the X address is fixed;

(d) register means for storing X width data dX and Y width data dY and for defining changes in the X and Y addresses by said X and Y address updating means; and

(e) means, connected to said X address updating means and said Y address updating means, for causing said X and Y address updating means to update the X and Y addresses repeatedly for the number of times defined by the X width data dX and the Y width data dY to form an updated X address equalling Xo+dX and an updated Y address equalling Yo+dY.

4,701,865

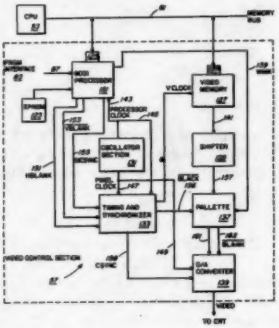
VIDEO CONTROL SECTION FOR A DATA PROCESSING SYSTEM

Robert W. Goodman, Hopkinton, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Jun. 25, 1984, Ser. No. 624,175

Int. Cl.[4] G06F *3/14*

U.S. Cl. 364—521 **4 Claims**



1. In a data processing system having a central processing unit, an input/output bus connected to said central processing unit, a memory bus connected to said central processing unit, a CRT display for displaying information, a video control section and an input/output controller, said input/output controller being connected to said central processing unit and to said input/output bus, said video control section controlling the operations of said CRT display and including:

a. a video memory connected to said memory bus for holding data and timing signals for said CRT display;

b. a microprocessor for managing the overall operations of said video control section, said microprocessor being connected to said input/output controller for receiving coded data signals from said input/output controller and being connected to said memory bus;

c. an EPROM connected to said microprocessor for holding an operating program for said microprocessor;

d. an oscillator section;

e. a timing and synchronizer circuit;

f. a shifter;

g. a palette; and

h. a D/A converter;

i. said oscillator section having an output connected to an input of said microprocessor and to an input of said timing and synchronizer circuit and an output connected to an input on said timing and synchronizer circuit and to an input on said D/A converter, said oscillator section generating a clock signal called PROCESSOR CLOCK which is sent to said microprocessor and to said timing and synchronizer circuit and a generating a signal called PIXEL CLOCK which is sent to said timing and synchronizer circuit and to said D/A converter;

j. said shifter being connected between an output on said video memory section and an input on said palette for receiving a serial stream of data signals from said video memory and sending said serial stream of data signals to said palette; and

k. said D/A converter having a pair of inputs, each connected to an output on said palette, an input connected to an output on said oscillator section an input connected to an output on said timing and synchronizer circuit and an output connected to an input of said CRT display, said D/A converter converting digital signals from said palette into analog signals from said palette into analog signals for transmission to said CRT display; and

l. said timing and synchronizer circuit having three inputs connected to three outputs on said microprocessor, an output connected to an input on said video memory, and outputs connected to said palette and to said D/A converter, said timing and synchronizer circuit receiving signals H BLANK, V BLANK, and 51C SYNC from said microprocessor and the signals PIXEL CLOCK and PROCESSOR CLOCK from said oscillator section and outputting a signal V CLOCK to said video memory, a signal BLACK to said palette and a signal CSYNC to said D/A converter, which signals are related to said signals received by said timing and synchronizer circuit.

4,701,866

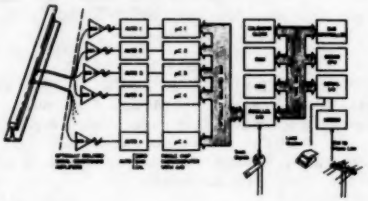
WHEEL LOAD MEASUREMENT

Harold D. Harrison, Powell, and James M. Tuten, Columbus, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Dec. 7, 1984, Ser. No. 679,165

Int. Cl.[4] G01L *1/00;* **B61L** *3/00, 11/08*

U.S. Cl. 364—550 **19 Claims**



1. Apparatus for measuring loads transmitted via wheels to a track from vehicles travelling thereon, comprising

(A) means at each of a plurality of approximately equally spaced locations on a selected portion of the track at least about equal in length to the circumference of a typical wheel passing thereover, for providing signals responsive to load at each location,

(B) means, responsive to the signals from all of the load-responsive means A, for providing a signal that is a function of the largest load on the track from each wheel,

(C) means, responsive to the largest-load signal from the means B, for comparing each largest load with at least one selected load level, and

(D) means, responsive to the largest-load-comparing means C, for identifying each wheel from which any load greater than a selected level was transmitted.

4,701,867

ELECTRICAL TESTING DEVICE FOR A VEHICLE COMBINATION INSTRUMENT

Ulrich Brüggemann, Oberursel, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,546

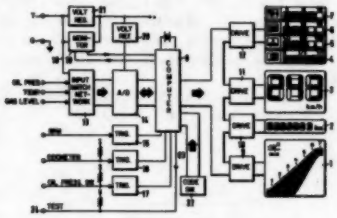
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332386

Int. Cl.[4] G06G *7/48;* **G01R** *15/12*

U.S. Cl. 364—550 **9 Claims**

1. In an electric testing device or vehicle combination instrument which combination instrument comprises display means made of segments, a display control coupled to the display means and including a microcomputer for activating the segments as a function of measured values, an analog-digital converter arranged in front of the display control for analog input signals, and an optional input network arranged in front of the converter, the improvement of the testing device wherein

in the microcomputer of the display control, there is for each measurement value a range of tolerance value of a critical display value stored 2 which tolerance value is compared by said microcomputer, in a first final-test phase of a manually controllable final-test operating mode, with a simulated measurement value; and wherein the simulated measurement value is feedable into the microcomputer via the analog-digital converter; a display value which represents the result of the comparison is stored in the microcomputer and is transferable to the display means as a



function of the result of the comparison; and by the display control, fixed, predetermined segment combinations are actuatable one after the other in other manually controllable final-test phases in the test operating mode; and wherein said testing device further comprises

equivalent resistors which simulate the measurement value and wherein said testing device further comprises switches which serves to call up the final-test operating mode and for further connection of the final-test phases.

4,701,868

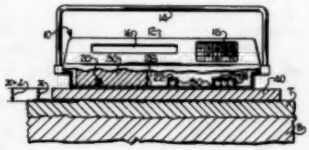
APPARATUS AND METHOD FOR ACCURATELY MEASURING THE DENSITY OF MATERIALS WITH ROUGH SURFACES BY RADIATION BACKSCATTER

Ali Regimand, Raleigh, N.C., assignor to Troxler Electronic Laboratories, Inc., Research Triangle Park, N.C.

Filed Dec. 13, 1984, Ser. No. 681,303

Int. Cl.[4] G06F *15/52;* **G01V** *5/00*

U.S. Cl. 364—558 **9 Claims**



1. A method of measuring the density of a material having a rough upper surface by means of radiation backscatter, said method comprising

positioning on the rough upper surface of the material a block of known density and thickness,

directing gamma radiation from a source into the block and into the underlying material,

obtaining from at least two geometrically differing source-to-detector relationships separate and distinct measurements of radiation scattered from the block and from the underlying material,

calculating from said separate and distinct radiation measurements the density of an upper zone of predetermined thickness greater than the thickness of the block and which includes the thickness of the block as well as that portion of the underlying material which forms said rough upper surface,

also calculating from at least one of said radiation measure-

ments the composite density of the block and the underlying material, and

calculating from said composite density and from said upper zone density the density of the material as it exists below said rough upper surface thereof whereby the density value which is obtained is unaffected by the roughness of the surface of the material.

4,701,869

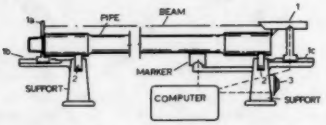
PIPE MEASUREMENT, LABELING AND CONTROLS

Stephen R. Callegari, Sr., 419 Orangewood Dr., Lafayette, La. 70503; Luther A. Harrison, and Robert W. Salsman, Jr., both of Lafayette, La., assignors to Stephen R. Callegari, Sr., Lafayette, La.

Filed Mar. 25, 1985, Ser. No. 715,829

Int. Cl.[4] G01D *5/34*

U.S. Cl. 364—562 **9 Claims**



1. In the measurement of pipe joint lengths and automatic labeling of the surface of each pipe joint, a combination comprising:

(a) positioning means for positioning a joint of pipe;

(b) measuring means arranged to measure the distance between surfaces, positioned by said positioning means, representing the effective length of said positioned pipe, said measuring means to produce an output signal representative of said effective length measured;

(c) electronic processor means arranged to receive said output signal and comprising; manual input keyboard means, digital display means, means to process said output signal into numerical effective length for digital display, data memory register means capable of storing, for recall, said numerical effective length and associated data entered into said manual input keyboard means and means to deliver an output command signal representative of a label format and content; and

(d) label maker means operatively associated with said positioning means, responsive to said output command signal, to physically and directly produce a label on a selected area of the surface of said positioned pipe.

4,701,870

INTEGRATED CIRCUIT DEVICE TESTABLE BY AN EXTERNAL COMPUTER SYSTEM

Takao Mogi, and Masahiko Morizono, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 28, 1985, Ser. No. 749,825

Claims priority, application Japan, Jul. 13, 1984, 59-145656

Int. Cl.[4] G05B *23/02;* **G06F** *11/30, 13/12*

U.S. Cl. 364—580 **5 Claims**

1. An integrated circuit device for electronic equipment having an internal bus adapted for connection at a port to an external computer system, the integrated circuit device comprising:

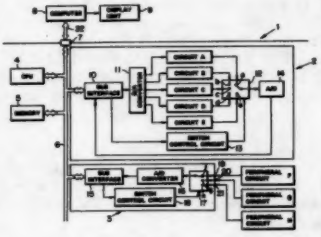
a plurality of input terminals;

a switch circuit connected to said plurality of input terminals for selecting any one of a respective plurality of analog input signals via said plurality of input terminals;

a switch control circuit for controlling said switch circuit to select any one of said input signals in dependence on a selection signal;

an analog-to-digital converter for converting the selected input signal from said switch circuit into a corresponding serial digital signal; and

a bus interface circuit connected to said internal bus for sending said serial digital signal from said analog-to-digital



converter over said internal bus directly to said port for reception by said external computer system and for sending said selection signal received directly from said port over said internal bus to said switch control circuit.

4,701,871

SIGNAL GENERATOR USING DIGITAL MEMORY

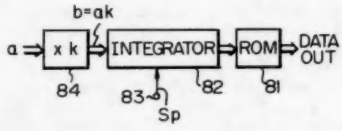
Takayuki Sasaki, Kanagawa, and Masaaki Arai, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,226

Claims priority, application Japan, Oct. 7, 1983, 58-187973

Int. Cl.[4] G06F *1/02*

U.S. Cl. 364—718 **7 Claims**



5. A signal generator using a digital memory for generating a frequency modulated digital signal having a value which varies periodically, the signal generator comprising: a memory having 2^n addresses in which data of one period of said digital signal is stored; a circuit for multiplying a digital video signal having a variable value by a predetermined coefficient; and an integrator for integrating the digital video signal multiplied by said coefficient at predetermined clock intervals in order to produce an address signal for said memory, said address signal varying step by step over a predetermined number of clock intervals in dependence on the digital level of said digital video signal and said predetermined coefficient.

4,701,872

APERIODIC WAVEFORM GENERATION USING STORED MARKERS IDENTIFYING SCALED WAVEFORM SECTIONS

Masatsugu Kitamura, Atsugi; Kikuji Wagatsuma, Sagamihara; Tokumi Watanabe, Tokyo; Naoki Yamashita, Tokyo, and Hiroshi Yoshida, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Nov. 30, 1984, Ser. No. 676,840

Claims priority, application Japan, Dec. 2, 1983, 58-228064

Int. Cl.[4] G06F *1/02;* **G10H** *1/00, 1/02*

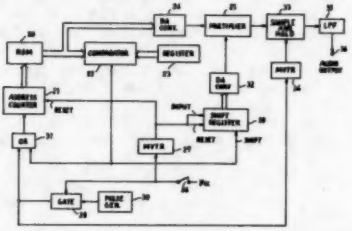
U.S. Cl. 364—718 **3 Claims**

2. A waveform generator for generating an aperiodic waveform of the type having a gradually decaying envelope, comprising:

a memory sequentially storing a sequence of digital samples representing the magnitude of said waveform at sample points, said digital samples being grouped into first and second continuous portions, said second portion comprising that portion of said sequence in which none of said digital samples has a magnitude exceeding 1/n the magnitude of a largest one of said digital samples, wherein n is an integer greater than unity, each of said digital samples of said second portion being scaled by a factor of n, said memory further storing a code indicating the beginning of said second portion;

a source of clock pulses;

an address counter for developing an address signal for sequentially addressing the stored digital samples and the



stored code from the memory in response to said clock pulses;

first means for supplying an additional clock pulse to said address counter in response to said stored code being addressed by said address counter;

second means responsive to said memory and to said first means for scaling each of the addressed digital samples of said first and second portions and converting it to a signal having a magnitude corresponding to the magnitude of the associated digital sample of said sequence; and

further comprising a sample-and-hold circuit responsive to said second means and means responsive to said clock pulses for causing said sample-and-hold circuit to sample and hold said signal from said second means.

4,701,873

METHOD AND A CIRCUIT ARRANGEMENT FOR DIGITAL SIGNAL PROCESSING UTILIZING ADAPTIVE TRANSVERSAL FILTER TECHNIQUES

Heinrich Schenk, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,596

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345284

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—724 **12 Claims**

7. A circuit arrangement for digital signal processing with a settable adaptive transversal filter, comprising:

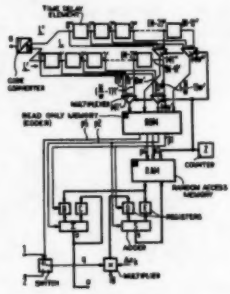
an N−1 stage delay chain including an input for receiving a serial input digital signal having A possible values, and N/w group of, in each case, w consecutive taps for tapping signal elements;

scanning means operating N/w times faster than said delay chain, including N/w groups of inputs respectively connected to a group of w consecutive taps, and an output;

a coder including an input connected to said output of said scanning means for encoding scan signals, and an output;

memory means including a write-read memory including a control input, a read output and a write output, said control input connected to said output of said coder, for storing subsum signals, said subsum signals corresponding to the N/w consecutive groups of A^w possible combinations each of w consecutive tapped signal elements evaluated in accordance with the relative filter setting; and

adder means comprising a first input circuit connected to said read output of said memory and to said output of said



coder, a second input circuit and an output circuit connected to said second input circuit, said adder means operating in response to its input subsum signals during each delay step to provide a processed output signal.

4,701,874

DIGITAL SIGNAL PROCESSING APPARATUS

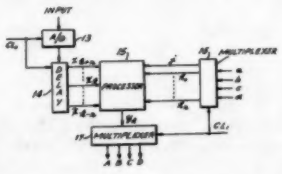
Takashi Akai; Katsuro Okamoto, both of Tokyo, and Shiro Usui, Toyohashi, all of Japan, assignors to NEC Corporation, Japan

Filed Dec. 12, 1983, Ser. No. 560,447

Claims priority, application Japan, Apr. 6, 1983, 58-60263; Apr. 8, 1983, 58-61736

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—724 **9 Claims**



1. A digital signal processing apparatus comprising:

a first signal processing section including delay means for generating (2p+1) signals x_{k-n} to x_{k+n} (n=0, 1, 2, . . . , p) each having a different respective delay time and means responsive to said signals x_{k-n} to x_{k+n} for calculating a first output signal

$$y_k = h_0 x_k + \sum_{n=1}^{p} h_n (x_{k+n} + j \cdot x_{k-n}),$$

wherein j and h_0 to h_n are "±1" and "1" or "0", respectively;

a second signal processing section responsive to said first output signal y_k or said signal x_k for calculating a second output signal in the same manner as said first signal processing section, said second signal processing section having the same construction as said first signal processing section; and

means for delivering a third output signal from a center tap of the delay means of said second signal processing section, said second output signal and said third output signal being maintained in synchronism with one another.

4,701,875

HIGH SPEED CONVOLUTION ARITHMETIC CIRCUIT WITH MULTIPLE COUNTERS

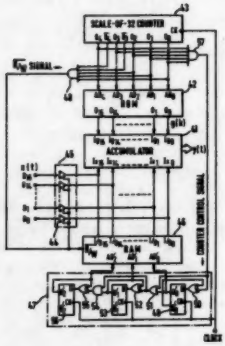
Kazuo Konishi, Tokyo, and Meisei Nishikawa, Musashino, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 26, 1984, Ser. No. 674,844

Claims priority, application Japan, Nov. 26, 1983, 58-221409; Feb. 13, 1984, 59-22756

Int. Cl.[4] G06F *15/31*

U.S. Cl. 364—728 13 Claims



1. A convolution arithmetic circuit for performing convolution processing on an input sequence composed of a series of values obtained at a sampling frequency, said convolution processing also using a response sequence composed of a predetermined number of elements, said convolution arithmetic circuit comprising:

a first memory that store said elements of said response sequence in a predetermined order;

a second memory means for storing that stores said input sequence values;

a scale of N counter, response to a clock signal, said scale of N counter providing a first series of count values which serve as addresses for said first memory, where N is an integer indicating said predetermined number sequence elements in said response sequence;

a scale of N/a counter, also responsive to said clock signal, for providing a second series of count values which serve as addresses for said memory, where a is an integer divisor of N chosen according to said sampling frequency; accumulating means, coupled to said first and second memories, for computing a sum of a series of products of elements of said response sequence from said first memory and corresponding values of said input sequence from said second memory; and

control means, coupled to said scale of N counter, for generating a control signal to alter the order of the second series of count values provided by said scale of N/a counter.

4,701,876

DIGITAL DATA PROCESSOR FOR MULTIPLYING DATA BY A COEFFICIENT SET

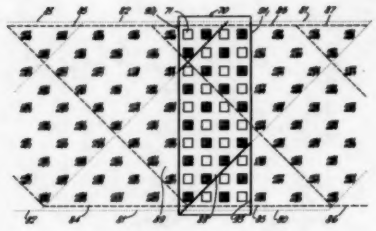
John V. McCanny, Belfast, Northern Ireland; John G. McWhirter, Malvern, and Kenneth W. Wood, Newcastle-upon-Tyne, both of England, assignors to National Research Development Corporation, London, England

Filed Sep. 17, 1984, Ser. No. 651,312

Claims priority, application United Kingdom, Oct. 5, 1983, 8326690

Int. Cl.[4] G06F *15/336, 15/347*

U.S. Cl. 364—728 8 Claims



1. A digital data processor for carrying out a multiplication operation involving a stream of data words and a set of coefficient words to form output terms, each consisting of a sum of data/coefficient products, comprising:

(1) an array of bit-level logic cells arranged in rows and columns;

(2) each logic cell is arranged to:

(a) input data, coefficient, carry and cumulative sum bits,

(b) compute output cumulative sum and carry bits corresponding to addition of the input cumulative sum and carry bits to the product of the input data and coefficient bits, each cumulative sum bit being a contribution to a respective bit of an output term,

(c) output the data, coefficient and output cumulative sum bits, and

(d) recirculate the output carry bit via a clock-activated carry latch to provide the respective cell with an input carry bit for a succeeding computation;

wherein each array row has a data input and a coefficient input at mutually opposite row ends for input of data and coefficient words bit-serially with least significant bits leading, each coefficient word being associated with a respective row;

wherein each pair of row neighbour cells is interconnected via a respective data line and coefficient line and each pair of column neighbour cells is interconnected via a respective cumulative sum line, and

(3) a respective clock-activated latch provided on each said line for bit storage and advance for data and coefficient bit movement in counterflow along array rows and cumulative sum bit movement down array columns; said clock-activated latches providing delays appropriate to time movement of carry, data, coefficient and cumulative sum bits such that in operation of the array each cell computes contributions to output terms in ascending order of bit significance and cumulative sum generation is cascaded down array columns to yield sums of contributions to respective output term bits; and

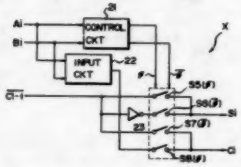
(4) accumulating means coupled to cumulative sum outputs of final cells of said array columns, for adding said outputs together, the accumulating means incorporating bypassable delaying means arranged to counteract relative delay between array output of sums of contributions to each output term bit.

4,701,877

HIGHSPEED PARALLEL ADDER WITH CLOCKED SWITCHING CIRCUITS

Masayuki Sahoda, Yokohama; Fuminari Tanaka, Kawasaki, and Tetsuya Iida, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 27, 1984, Ser. No. 675,303
Claims priority, application Japan, Nov. 28, 1983, 58-223553
Int. Cl.[4] G06F 7/50
U.S. Cl. 364—784 15 Claims



1. A full adder circuit comprising:

an addend input terminal, an augend input terminal, a sum output terminal, a carry input terminal, and a carry output terminal;

a control circuit responsive to an addend input signal and an augend input signal applied to said addend input terminal and said augend input terminal, respectively, for providing a switch control signal which has a first logic level when the addend and augend input signals are equal and a second logic level when the addend and augend input signals are not equal;

input circuit means, responsive to at least one of said addend and augend input signals, for providing an output signal based on said addend or augend input signal; and

switching means, coupled to receive said output signal of said input circuit and said switch control signal, for providing a carry output signal and a sum output signal at said carry output terminal and said sum output terminal, respectively, said switching means including first to fourth clocked inverting switches for inverting signals at their inputs when enabled by said switch control signal from said control circuit,

said first inverting switch having an output and having an input connected to receive a carry input signal applied to said carry input terminal,

said second inverting switch having an input connected to receive an inverse signal of the carry input signal and having an output connected to the output of said first inverting switch and to said sum output terminal,

said third inverting switch means having an output and having an input being connected to the input of said first inverting swtich to receive the carry input signal, and

said fourth inverting switch having an input connected to receive the output signal of said input circuit and having an output connected to the output of said third inverting switch and to said carry output terminal,

wherein one of said first and second inverting switches and one of said third and fourth of said third and fourth inverting switches are enabled when said switch control signal is at the first logic level, and

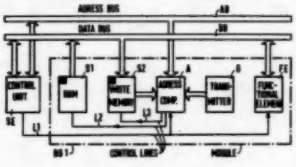
wherein the other of said first and second switches and the other of said third and fourth switches are enabled when said switch control signal is at the second logic level.

4,701,878

APPARATUS FOR ASSIGNING ADDRESSES TO PLUGGABLE MODULES BASED ON CONTACT CONFIGURATION

Hans-Dieter Günkel, Erlangen, and Josef Röhrle, Hessdorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 13, 1984, Ser. No. 681,184
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1983, 3347357
Int. Cl.[4] G06F 12/00, 13/00
U.S. Cl. 364—900 6 Claims



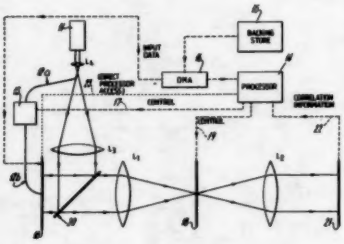
1. A circuit arrangement comprising a plurality of electronic circuit modules interconnected by bus means for communicating address, data and control information between the modules and a control unit, the modules being coupled to a module carrier by respective plug connection means, a plug location being associated with each plug connection means, said plug connection means comprising contact means for said address, data and control line information, and further having a plurality of contacts on which a pattern of logic signals is impressed, a different pattern being electrically associated with the respective plug location for each module as a plug location code, each module respectively having a first memory means wherein a module code indicating the type of module is stored, said first memory means being coupled to the bus means, each module respectively comprising an address comparator means coupled to the bus means for comparing addresses on said bus means, and supplied by said control unit, to the respective plug location code during an initialization phase controlled by said control unit, said control unit during said initialization phase sequentially interrogating each module on said bus means by consecutively supplying all possible plug location codes via said bus means, said module comprising means for providing said module code stored in said first memory means to said control unit, said control unit comprising means for determining the type of module from the module code from the first memory means present at each plug location, said control unit further comprising means for addressing each of the modules via said bus means and for providing to each module a respective further address for performing further data communications between the control unit and the modules, each module further comprising a second memory means coupled to the bus means having stored therein a further address for carrying on said further data communication between the control unit and said modules, said address comparator means comprising means responsive to a control signal on a control line coupling said control unit and each of said modules and for comparing the further addresses on said bus means with said further address in said second memory means after completion of the initialization phase, said plug location codes being available as further addresses after said initialization phase.

4,701,879

ASSOCIATIVE MEMORY SYSTEMS

Robert W. A. Scarr, Stansted, United Kingdom, assignor to Standard Telephones and Cables Public Limited Co., London, England

Filed Jun. 24, 1985, Ser. No. 747,717
Claims priority, application United Kingdom, Jul. 5, 1984, 8417187
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—49 13 Claims



13. An associative optical memory system comprising a matched optical holographic filter, including an input plane comprised by a liquid crystal over silicon display, a Fourier transform plane and an output plane, the planes being separated by thin spherical lenses, and a coherent light source, and a digital computing system including a processor and a direct memory access element loaded by a backup store, which computing system is coupled to the filter for controlling the input and Fourier transform planes and the light source for parallel optical processing of the memory content, the output plane providing information to the processor as to the location of occurrences in the memory of a searched for item, wherein in use of the memory system a page of the memory content is loaded into the input plane, stored and the display blanked, a representation of the item to be recognised is loaded into a defined area of the display and a hologram thereof recorded in the Fourier transform plane by a pulsed reference beam derived from the coherent light source, wherein the loaded page is then displayed and illuminated by another beam derived from the coherent light source, wherein the light is filtered in the Fourier transform plane, detected at the output plane, decoded and passed to the processor for use in determining the location in the memory of the input display of the occurrences.

4,701,880

OPTICAL SYSTEM FOR RECORDING/REPRODUCING INFORMATION BY MEANS OF A DIELECTRIC BREAKDOWN EFFECTED BY PHOTOSWITCHING OF A BIAS-VOLTAGE

Katsutarou Ichihara, Kawagoe, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

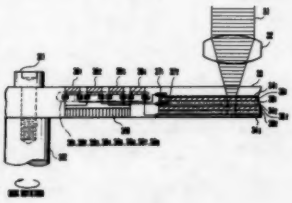
Filed May 7, 1985, Ser. No. 731,360
Claims priority, application Japan, May 9, 1984, 59-92441
Int. Cl.[4] G11C *13/00, 11/42;* G11B *11/18*
U.S. Cl. 365—106 22 Claims

1. An optical information recording/reproducing system comprising

(A) a recording medium comprised of (i) a recording-bit producing layer that comprises a fluorescent substance, (ii) a photoconductive layer and (iii) conductive layers between which layers (i) and (ii) are interposed, respectively, at least one of the conductive layers being transparent;

(B) means for selectively applying a voltage to both sides of the recording medium;

(C) means for radiating an optical recording beam to a site on the recording medium while applying a voltage to the recording medium and, then, applying a high electric field to the recording-bit producing layer by way of the photoconductive layer, the resistance of the recording-bit producing layer being lowered at the site, such that a dielectric breakdown is developed and the fluorescent substance loses fluorescence, whereby information is recorded in said recording-bit producing layer; and



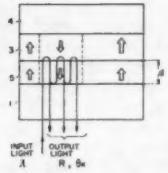
(D) means for radiating an optical reproducing beam on the recording medium without applying any voltage to the recording medium and, then, reproducing information when fluorescence is produced by the fluorescent material, wherein said dielectric breakdown is effected by the photoswitching of a bias-voltage in the system.

4,701,881

MAGNETO-OPTICAL RECORDING MEDIUM

Fujio Tanaka, Tanashi, and Nobutake Imamura, Kamakura, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1985, Ser. No. 748,580
Claims priority, application Japan, Jul. 9, 1984, 59-140672
Int. Cl.[4] G11C *11/42*
U.S. Cl. 365—122 5 Claims



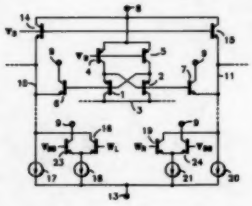
1. A magneto-optical recording medium comprising:

a magnetic thin film recording layer of a vertically magnetized magnetic material formed of a rare earth transition metal alloy having a Curie temperature or magnetic compensation temperature as low as 50° to 250° and a coercive force as large as 1 KOe or more and having an easy axis of magnetization perpendicularly to the film surface; a substantially transparent magnetic material film layer disposed in contact with the recording film layer, large in the Faraday rotation angle and having an easy axis of magnetization perpendicularly to the film surface and magnetizable in the same direction as the recording film layer by exchange coupling or magnetostatic coupling therebetween; a transparent substrate disposed on the side of incidence of light and on which the magnetic material film layer is disposed, and said substantially transparent magnetic material film layer being composed of material selected from the group consisting of Fe_3O_4, $CoFe_2O_4$ and materials of garnet systems.

4,701,882
BIPOLAR RAM CELL

Mark S. Birrittella, Phoenix, and James J. Stipanuk, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 16, 1985, Ser. No. 809,982
Int. Cl.[4] G11C *11/00*
U.S. Cl. 365—154 6 Claims

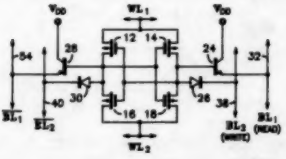


1. A memory cell having a first bit line, a second bit line, and only one word line, comprising:
- a first voltage terminal;
- a second voltage terminal;
- a first load;
- a second load;
- a pair of latchable cross-coupled transistors having their emitters coupled to said word line, their collectors coupled to said first voltage terminal by said first and second load, respectively, and their bases coupled to each other's collector;
- first means coupled between said second voltage terminal and said first bit line and coupled to said base of one of said pair of latchable cross-coupled transistors for sinking current from said base of said one of said pair of latchable cross-coupled transistors, wherein a voltage on said voltage terminal is greater in magnitude than the voltage on said first bit line; and
- second means coupled between said second voltage terminal and said second bit line and coupled to said base of the other of said pair of latchable cross-coupled transistors for sinking current from said base of the other of said pair of latchable cross-coupled transistors, wherein a voltage on said voltage terminal is greater in magnitude than the voltage on said first bit line.

4,701,883
ECL/CMOS MEMORY CELL WITH SEPARATE READ AND WRITE BIT LINES

Robert S. Wrathall, Tempe, and Kevin L. McLaughlin, Chandler, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jun. 19, 1986, Ser. No. 875,909
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—154 17 Claims

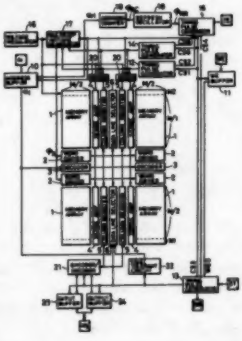


1. A memory cell comprising: first, second, third and fourth transistors each having a control terminal and first and second load terminals, said first load terminals of said first and second transistors coupled together for connection to a first word line terminals, said first load terminals of said third and fourth transistors coupled together for connection to a second word line terminal;
- a fifth transistor having a control terminal and first and second load terminals, said first load terminal of said fifth transistor coupled to a source of supply voltage and said second load terminal of said fifth transistor for coupling to a first bit line;
- a first diode having anode and cathode terminals, said anode terminal coupled to the control terminals of said first, third and fifth transistors and to said second load terminals of said second and fourth transistors, said cathode terminal of said first diode for coupling to a second bit line;
- a sixth transistor having a control terminal and first and second load terminals, said first load terminal of said sixth transistor coupled to said source of supply voltage and said second load terminal of said sixth transistor coupled to a complemented first bit line; and
- a second diode having anode and cathode terminals, said anode terminal coupled to the control terminals of said second, fourth and sixth transistors and to said second load terminals of said first and third transistors, said cathode terminal of said second diode coupled to a complemented second bit line.

4,701,884
SEMICONDUCTOR MEMORY FOR SERIAL DATA ACCESS

Masakazu Aoki, Tokorozawa; Masashi Horiguchi, Kokubunji; Yoshinobu Nakagome, Hachioji; Shinichi Ikenaga, Kokubunji; Katsuhiro Shimohigashi, Musashimurayama; Toshiaki Masuhara, Tokyo; Kiyoo Itoh, Higashikurume; Hideo Nakamura, and Osamu Minato, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 14, 1986, Ser. No. 896,257
Claims priority, application Japan, Aug. 16, 1985, 60-179416; Aug. 16, 1985, 60-179418; Aug. 16, 1985, 60-179419; Oct. 9, 1985, 60-223706; Oct. 21, 1985, 60-233237; Mar. 14, 1986, 61-54767; Jun. 11, 1986, 61-133653
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189 26 Claims



1. A semiconductor multilevel data memory comprising;
- an array comprising a plurality of memory cells each having at least a single capacitors,
- a selective means for sequentially selecting each memory cell in a predetermined order,
- data lines which are connected to said memory cells for transmitting the data,
- a mechanism for writing the data connected to the data lines,
- a mechanism for reading the data which is connected to the data lines and having a column register having at least a data deciding mechanism, a transfer gate provided be-

tween said deciding mechanism and the above-described data lines, and a bias charge feed mechanism provided between said transfer gate and said deciding mechanism which is provided with,

at least, two or more memory elements for temporarily storing the above-described data,

a voltage generator generating in a time series three values or more voltages which are different from each other and a means for applying said voltages to said memory cells,

a means for performing the input and output of the data in a synchronized relation with a clock signal which is to be applied from the exterior of the semiconductor multilevel data memory device, and,

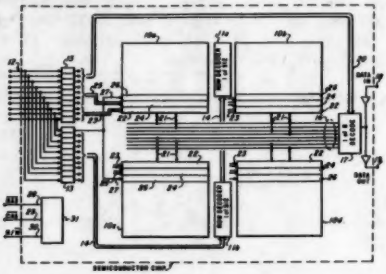
a means for issuing a signal indicating that preparation of the input and output of the data has been completed.

4,701,885

DYNAMIC MEMORY ARRAY WITH QUASI-FOLDED BIT LINES

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 26, 1984, Ser. No. 634,899
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—189 **20 Claims**



12. A semiconductor dynamic read/write memory device comprising:

an array of rows and columns of one-transistor read/write memory cells formed in a face of a semiconductor body each column having a pair of balanced bit lines connected to memory cells of the columns, each memory cell in a row having an access transistor with a gate connected to a row line for the row of cells,

a plurality of differential sense amplifiers, each sense amplifier having a pair of inputs coupled to said pair of bit lines of a different one of said columns, said pair of bit lines both being physically located on the same side of the sense amplifier in a folded bit line configuration,

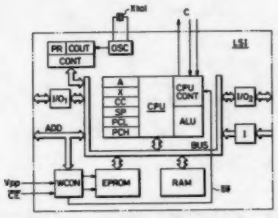
said memory cells in a column being positioned in an even number of groups of adjacent cells, each group containing a plurality of memory cells, the source-to-drain paths of the access transistors of all of the cells contain within each group being coupled to the same one of the bit lines of the pair, the cells in alternate groups being connected to alternate ones of said pair of bit lines.

4,701,886

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Yasuhiro Sakakibara, Kodaira; Isamu Kobayashi, Tokyo, and Yoshinori Suzuki, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed Aug. 21, 1985, Ser. No. 768,112
Claims priority, application Japan, Aug. 22, 1984, 59-173329
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—189 **17 Claims**



1. A semiconductor integrated circuit device comprising:

a first line to which an address signal is to be applied;

an electrically programmable read only memory to which said address signal is to be applied through said first line wherein said electrically programmable read only memory has a predetermined address space defining a range of addresses assigned to the electrically programmable read only memory;

an external terminal coupled to said electrically programmable read only memory to which data to be read out from said electrically programmable read only memory and data to be fed to said electrically programmable read only memory are to be applied; and

a control circuit coupled to said first line, and having: a function to discriminate whether or not said address signal is within the address space of said electrically programmable read only memory; and a function to set the data to be outputted to said external terminal at a predetermined level indicating satisfactory operation of said electrically programmable read only memory when said address signal designates an address other than those within the address space of said electrically programmable read only memory to prevent an improper indication of error in the electrically programmable read only memory when it is addressed with an address signal not within its address space.

4,701,887

SEMICONDUCTOR MEMORY DEVICE HAVING A REDUNDANCY CIRCUIT

Junji Ogawa, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 7, 1985, Ser. No. 763,269
Claims priority, application Japan, Aug. 14, 1984, 59-168772
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—200 **10 Claims**

1. A semiconductor memory device operatively connected to receive a clock signal, comprising:

a random-access memory arranged in columns having addresses and including at least one redundancy column for replacing a defective column;

serial output means, operatively connected to said random-access memory, for receiving data read out of said random-access memory in parallel and serially outputting the received data; and

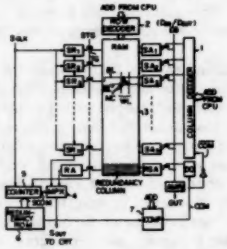
redundancy means, operatively connected to said serial output means and operatively connected to receive the clock signal, for replacing data from said defective col-

umn serially output from said serial output means with data from said redundancy column, said redundancy means comprising:

at least one read-only memory for storing an address corresponding to said defective column;

at least one latch means, operatively connected to said redundancy column, for latching data read out of said redundancy column;

at least one comparator, operatively connected to said at least one read-only memory, for comparing an input column address with the defective column address and for



outputting a coincidence signal when said input column address coincides with said defective column address;

at least one counter, operatively connected to said at least one read-only memory and operatively connected to receive the clock signal, being activated by the clock signal and outputting a coincidence signal when the number in said counter coincides with a column number indicating said defective column; and

a multiplexer, operatively connected to said counter, for replacing data in said defective column with data in said redundancy column upon receipt of said coincidence signal.

4,701,888

DATA BUS DISCHARGING CIRCUIT

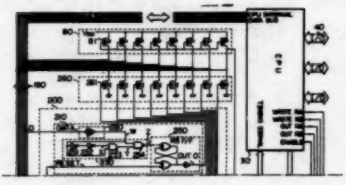
Hiroshi Yokouchi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 772,943

Claims priority, application Japan, Sep. 6, 1984, 59-185379

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—203 **6 Claims**



1. A data bus discharging circuit for selectively discharging bit lines of a data bus after all of said bit lines of said data bus have been precharged to or near a power supply voltage, said data bus discharging circuit comprising:

(a) a plurality of discharge detection circuits, each of which is respectively connected to one of said plurality bit lines of said data bus for detecting a small voltage change on a corresponding bit line which is to be charged to or near a ground voltage immediately after data is loaded into said data bus, all of said plurality of bit lines having been initially precharged to or near said power supply voltage in a data output operation, and for then providing a discharge control signal;

(b) a plurality of discharging means each of which is respectively connected between one of said plurality of discharge detection circuits and its corresponding bit line for quickly reducing the voltage thereon to or near said ground voltage on receipt of said respective discharge control signal; and

(c) a controlc circuit connected to each of said plurality of discharge detection circuits for providing said control signal to said discharge detection circuit in said data output operation; whereby data can be loaded into said data bus at a high speed at an earlier stage of said data output operation.

4,701,889

STATIC SEMICONDUCTOR MEMORY DEVICE

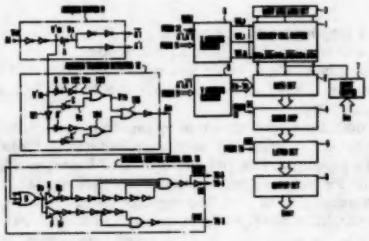
Manabu Ando, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,006

Claims priority, application Japan, May 31, 1984, 59-111317

Int. Cl.[4] G11C *8/00*

U.S. Cl. 365—230 **4 Claims**



1. A static semiconductor memory device, comprising:

a memory cell matrix comprised of memory cells arranged in rows and columns;

a row address decoder for selecting one of said rows;

a set of address input terminals for receiving address signals;

a sense amplifier for operatively amplifying data from one of said columns;

a latching circuit for operatively holding data amplified by said sense amplifier;

an internal control circuit for generating first to third control signals when at least one of said address singals is changed in level, said internal control circuit generating said first and second control signals when a level of said changed address signal is in the range of V_1 to V_2, and generating said third control signal when a level of said changed address signal is in the range of V_3 to V_4, respectively;

means for applying said first control signal to said row address decoder, said row address decoder being enabled by said first control signal and determining the selection of a row based on said changed address signal when a level of said changed address signal is at V_5;

means for applying said second control signal to said sense amplifier to thereby enable said sense amplifier; and

means for applying said third control signal to said latching circuit to thereby leave said latching circuit in a precharging state;

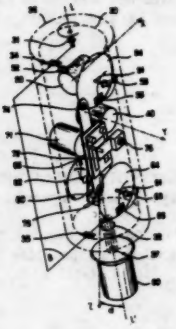
wherein the condition $V_1<V_3<V_5<V_4<V_2$ is satisfied.

4,701,890

DEVICE FOR LOCKING A SET OF GIMBAL-MOUNTED DETECTORS

Herve Ohmer, Voisin7s le Bretonneux, and Alain G. M. Delpuech, Le Plessis Robinson, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 23, 1986, Ser. No. 855,024
Claims priority, application France, Dec. 17, 1985, 85 18656
Int. Cl.[4] G01V 1/00
U.S. Cl. 367—25 20 Claims



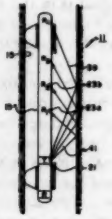
1. A logging sonde, comprising:
(a) a cylindrical body fixed to said sonde;
(b) a frame lodged inside said cylindrical body and free to rotate relative to said body about a longitudinal axis of said body;
(c) detector means supported by said frame and including at least one detector free to rotate relative to said frame; and
(d) a locking device supported by said frame, said locking device including braking means which is arranged in such a manner as to lock said detector means relative to the cylindrical body, and a release means for unlocking said detector means so as to allow relative movement between said detector means and said cylindrical body when said release means is activated.

4,701,891

METHOD AND APPARATUS FOR MEASURING FORMATION COMPRESSION AND SHEAR WAVE VELOCITY

John P. Castagna, Plano, and Robert W. Siegfried, II, Frisco, both of Tex., assignors to Atlantic Richfield Company, Plano, Tex.

Filed Feb. 13, 1986, Ser. No. 828,905
Int. Cl.[4] G01V 1/00, 1/28
U.S. Cl. 367—31 5 Claims



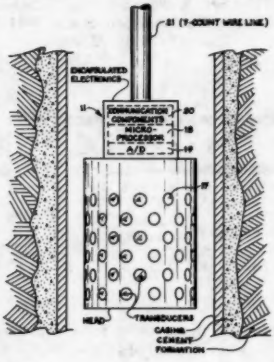
1. Apparatus for measuring formation compressional and shear wave velocities comprising:
a. a downhole tool suspended eccentrically in a borehole and having:
i. at least one transducer for transmitting acoustic energy responsive to a signal and a zero-offset receiver for showing zero offset time of transmission of said acoustic energy;
ii. a plurality of receivers disposed at a plurality of respective predetermined distances from said transmitter in first direction for receiving transmitted and reflected acoustic energy and capable of showing the amplitude of the received acoustic energy,; and
iii. a mud velocity and attenuation chamber between and in communication with said at least one transducer and receiver for measuring fluid acoustic energy transmission characteristics, including at least velocity and attenuation;
said tool having at least two feet separating said at least one transducer and the receiver farthest therefrom;
b. a plurality of conductors connected respectively with said at least one transducer and said receivers for transmitting signals indicative of transmission and reception of acoustic energy by respective transducer and receivers;
c. a recorder connected with at least said conductors;
d. an energizer for energizing said transducer and connected with at least said conductor to said transducer;
e. gating means for gating said receivers to listen for a time interval after time zero; and
f. discriminating means for discriminating the receivers indicating the largest amplitudes of arriving reflected acoustic energy;
thereby indicating the critical angles and therefore the compressional wave velocity and the shear wave velocity for the formation at the depth of the tool.

4,701,892

DOWNHOLE CASING INSPECTION SYSTEM

Leo J. Anderson, Lake Jackson, Tex., assignor to Sonar & Wells Testing Services, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 583,555, Feb. 27, 1984, abandoned. This application Sep. 22, 1986, Ser. No. 909,852
Claims priority, application Canada, Feb. 19, 1986, 502228
Int. Cl.[4] G01V 1/40, 1/00
U.S. Cl. 367—35 5 Claims



1. A downhole casing interior and exterior wall inspection tool comprising
a. a multiple element transducer head package containing at least a multiplicity of ¼ inch diameter transducers which transmit a signal and receive returns of said signal from the interior and exterior surfaces of said casing the number of said transducers being at least a sufficient to scan at least

60% of the inner wall surface of said casing, each transducer spaced apart from the other in a manner to transmit a signal unidirectionally towards the casing wall closest to said transducer and further said transducers being spaced in a pattern such that when a multiplicity of said transducers which are not adjacent to one another are fired the return from those fired will not interfere with the return from a near by fired transducer and said package containing a calibration transducer,

b. an electronic package associated with such transducer head package containing an component to convert the return signals from each transducer to a digitalized signal communicatable to a contained programmed microprocessor of said package, said microprocessor component programmed to report return signals which are different in time of return from a standard expected when the casing is in good condition and further preprogrammed to report a preprogrammed number of signals commensurate with that expected when the casing is in good condition but not all such signals as received from the transducer head package, through a communication component to a surface located CPU,

c. the communications component operatively associated with the electronic package enables communications of the output of the micro-processor, via wire-line, to the CPU at the surface,

d. the CPU at the surface programmed to visualize and report the signals which are received as significant from the expected norm as well as the preprogrammed number of expected signal returns,

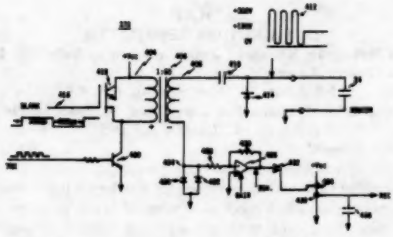
said transducer head package having each transducer spaced circumferentially and longitudinally in a staggered pattern of about 6 rows such that the signals generated from the transducers will scan from about 60 to about 100% of the interior of the casing when substantially all transducers in said package have been activated in a sequential pattern such that no two adjacent transducers are activated in sequence thus avoiding interference with an adjacent fired transducer's return at the speed of pull of the package past a longitudinal segment to be examined.

4,701,893

ULTRASONIC RANGING SYSTEM

Lon J. Muller, Groveland; Austin Franklin, Littleton, both of Mass., and Robert W. George, II, Windham, N.H., assignors to Denning Mobile Robotics, Inc., Woburn, Mass.

Filed May 16, 1986, Ser. No. 864,002
Int. Cl.[4] G01V 9/66; H04B 1/02
U.S. Cl. 367—87 **14 Claims**



1. An ultrasonic ranging system comprising:

transformer means;

means for selectively energizing said transformer means to produce a transducer drive signal, including timing means for generating a transmission period during which said transformer means is energized;

an ultrasonic transducer for transmitting an ultrasonic pulse in response to said drive signal and for developing an echo signal upon receipt of an echo pulse derived from said ultrasonic pulse;

damping means including a shunt switch connected across a winding of said transformer; and

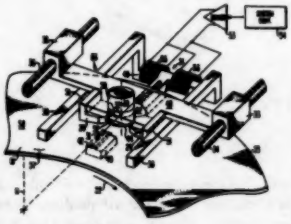
means, responsive to said timing means, for selectively closing said shunt switch at the end of said transmission period and quickly dampling the ringing following the transsmission of an ultrasonic pulse to a level substantially below the level of the echo signal to permit close ranging.

4,701,894

MAGNETIC BIASING APPARATUS FOR MAGNETO-OPTIC RECORDING INCLUDING A MAGNETIC CIRCUIT

Edwin G. Watson, Camden County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1986, Ser. No. 845,194
Int. Cl.[4] G11B 5/03, 13/04, 11/14
U.S. Cl. 369—13 **19 Claims**



1. In an optical system for recording information on a disc-shaped record medium, said record medium having a first surface for recording information thereon and having a second surface opposite said first surface, said system including drive means for rotating said record medium about a central axis thereof of normal to said first surface, said system additionally including source means for providing a focused beam of light incident on said first surface, said system further including means for establishing radial relative motion between said light beam and said first surface, an apparatus for generating a magnetic field at said first surface adjacent said focused light beam, said apparatus comprising:

an electromagnet having first and second pole pieces, said first pole piece comprising a first arm extending radially of said disc, positioned adjacent said second surface of said disc and aligned with a path of motion described by said focused light beam,

said second pole piece comprising a second arm, positioned adjacent said first surface of said disc on the opposite side of said disc from said first arm, said second arm being parallel to said first arm, said second arm being offset from the path of motion described by said focused light beam;

a relaying member, fabricated of a magnetic material, coupled to said means for establishing radial motion, said relaying member positioned in close sliding relation to said second arm, said relaying member relaying magnetic flux between said second pole piece and a position adjacent said focused light beam, wherein the magnetic flux relayed by said relaying member passes substantially vertically between said relaying member and said first pole piece through said disc at a point of incidence on said first surface of said focused light beam; and

source means for supplying an electrical current to said electromagnet to thereby provide opposing magnetic polarities in said first and second pole pieces.

4,701,895

MAGNETIC BIASING APPARATUS FOR MAGNETO-OPTIC RECORDING INCLUDING A PERMANENT MAGNET

Glen J. VanSant, Bucks County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1986, Ser. No. 845,693
Int. Cl.[4] G11B *5/03, 13/04, 11/14*
U.S. Cl. 369—13 20 Claims

1. In an optical system for recording information on a disc-shaped record medium, said record medium comprising an electrically-conductive material, said record medium having a first surface for recording information thereon and having a second surface opposite said first surface, said system including drive means for rotating said record medium about a central axis thereof normal to said first surface, said system additionally including source means for providing a focused beam of light incident on said first surface, said system further including means for establishing radial relative motion between said light beam and said first surface, an apparatus for generating a magnetic field of selectable polarity at said first surface adjacent said focused light beam, said apparatus comprising:

an elongated member having a longitudinal central axis, said member including a permanent magnet having diametrically-opposed poles thereon, said member being located adjacent said second surface of said record medium and positioned such that its longitudinal axis is parallel to said first surface, radially disposed with respect to the axis of rotation of said record medium, and aligned with a path of motion of said light beam, said member being positioned with respect to said record medium such that the magnetic field of said magnet induces eddy currents in said record medium when said record medium rotates, which eddy currents generate a second magnetic field opposing the magnetic field of said magnet, said member being rotatable about its longitudinal axis; and

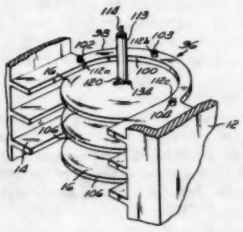
means for stopping rotational motion of said member, said rotational motion of said member being induced by the opposition of the magnetic field of said magnet to said second magnetic field associated with a nearby eddy currents, said stopping means stopping the rotational motion of said member selectively at first and second positions of said poles of said magnet relative to said record medium, wherein said first position locates one of said diametrically-opposed poles adjacent said second surface of said record medium, and said second position locates a second of said diametrically-opposed poles adjacent said second surface of said record medium.

4,701,896

INTERACTIVE PLURAL HEAD LASER DISC SYSTEM

Edward F. Allebest, Riverside; Parley E. Hansen, Sunnymead; George A. Walsh, Costa Mesa, and Walter R. Maguire, Newport Beach, all of Calif., assignors to Resolution Research, Inc., Newport Beach, Calif.

Filed Aug. 20, 1984, Ser. No. 642,505
Int. Cl.[4] G11B *17/22*
U.S. Cl. 369—32 2 Claims



1. An optical disc data storage and retrieval system for reading information stored on a plurality of optical discs having a plurality of tracks for storing information, comprising:

a disc drive shaft;

means for mounting a plurality of discs to the disc drive shaft spaced apart along the length thereof, the disc drive shaft being selectively engageable with the disc such that the discs are rotatable with the disc drive shaft;

said drive shaft and mounting means being mounted inside a housing having a plurality of slots therein, each slot being configured to receive a disc;

a plurality of read heads positioned proximate each of the discs for reading information stored thereon;

means for providing access to each disc in track thereon independently of the other disc and tracks; and

support means for supporting the disc in the slots when the disc drive shaft is disengaged from the disc;

wherein the disc drive shaft includes means for selectively lifting each disc off the support means and engaging the disc for rotation with the disc drive shaft.

4,701,897

OPTICAL DISK APPARATUS

Akira Nakagawa, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 28, 1984, Ser. No. 625,793
Claims priority, application Japan, Jun. 30, 1983, 58-119332
Int. Cl.[4] G11B *27/10, 7/095*
U.S. Cl. 369—32 6 Claims

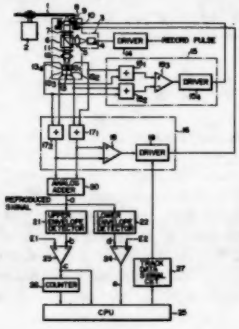
1. An optical disk apparatus comprising:

an optical head including means for emitting a light beam to an optical disk having a number of track grooves in a radial direction thereof and a photosensor for converting light reflected from said disk into an electric signal;

track jump data detecting means for detecting a track jump data component from said electric signal, the track jump data component corresponding to an accidental track jump of at least one track groove in the radial direction from a correct track groove;

jump extent detecting means for determining a number of tracks jumped and a jump direction from the track jump data component detected by said track jump data detect-

ing means to produce a return signal corresponding to the number of tracks jumped and the jump directions; and



tracking means, responsive to said return signal, for returning the laser beam to the track which was correct before jumping.

4,701,898

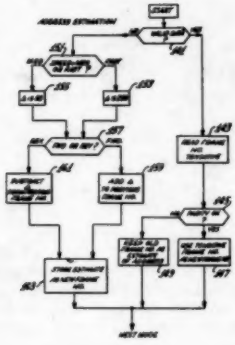
METHOD AND APPARATUS FOR LOCATING A SELECTED TRACK ON A RECORD DISC

Gary M. Giddings, Laguna Hills, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 333,236, Dec. 21, 1981, abandoned. This application Mar. 25, 1985, Ser. No. 715,852

Int. Cl.[4] G11B *17/22;* **H04N** *5/76*

U.S. Cl. 369—32 **10 Claims**



1. A method for locating a selected information containing target track having a known address from a plurality of substantially circular and concentric recording tracks on a record disc, wherein the information recorded on each track includes a unique track address signal, said method including the steps of:

rotating the disc;

moving an information recovery device radially relative to the disc, in the direction of the target track, to recover track address signals;

determining when the information recovery device improperly recovers a track address signal;

monitoring the radial speed of the information recovery device relative to the disc, and direction of movement of said device relative to the target track;

estimating the address(es) of the track(s) corresponding to the improperly recovered track address signal(s), wherein the estimated address(es) of the track(s) corresponding to the improperly recovered track address signal(s) is (are) related to the monitored radial speed and direction of the information recovery device; and

acting on said recovered and estimated track address information to locate the target track.

4,701,899

SWINGING RECORD CHANGER

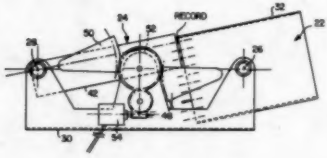
Stephane d'Alayer de Costemor d'Arc, Brussels, Belgium, assignor to Staar S.A., Brussels, Belgium

Filed Aug. 27, 1986, Ser. No. 900,890

Claims priority, application Belgium, Sep. 12, 1985, 215574; May 14, 1986, 216659

Int. Cl.[4] G11B *17/26, 17/28, 17/30*

U.S. Cl. 369—36 **16 Claims**



1. Record changer apparatus comprising:

a magazine for storing a plurality of records,

a playback/reproducing mechanism for receiving and playing or recording on a record transferred from said magazine,

means for transferring a record between said magazine and said playback/reproducing mechanism and vice versa,

means for mounting said magazine and said playback/reproducing mechanism for pivoting about distinct axes, and

means for moving said magazine and said playback/reproducing mechanism to produce coordinated opposite angular displacements thereof about their respective axes between different fixed positions in each of which said playback/reproducing mechanism is aligned with a different record in said magazine to allow transfer of a selected record therebetween when said mechanism and said magazine are located at one of the fixed positions.

4,701,900

DISC PLAYERS FITTED FOR AUTOMATIC CHANGE OF DISCS

Norio Hasegawa, Chiba; Toyomi Fujino, and Susumu Matsubara, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 30, 1985, Ser. No. 739,435

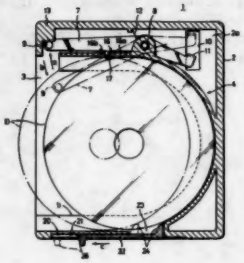
Claims priority, application Japan, May 31, 1984, 59-111788

Int. Cl.[4] G11B *5/012, 17/04, 17/26*

U.S. Cl. 369—36 **8 Claims**

1. A disc player fitted for automatic change of discs, comprising: disc pack receiving means for receiving and holding stationary a disc pack containing a plurality of discs and having a sliding member for sending out a disc from the disc pack and a disc setting member for moving a disc inserted in the disc pack to a proper position therein, disc rotating means for rotating a disc taken out from the disc pack and loaded thereon, and movable supporting means operative to move up and down in relation to said disc pack receiving means and provided thereon with mechanical means comprising a sliding lever for actuating the sliding member to take a selected disc out of the disc pack, a driving motor for rotating selectively in the clockwise and counterclockwise directions, a driving roller for being rotated with the rotatory driving force produced by said driving motor to carry the selected disc taken out from the

disc pack to said disc rotating means, a gear moving arm for being rotated with the rotatory driving force produced by said driving motor in one of first and second directions in accordance with the rotational direction of said driving motor, a driving gear supported by said gear moving arm to be rotated with the rotatory driving force produced by said driving motor, and a gear with teeth lacking partially for engaging with said driving gear to be rotated by a first predetermined rotatory angle in one direction to drive said sliding lever in the manner for taking a disc out of the disc pack when said gear moving arm is rotated in the first direction and also engaging with said driving gear to be rotated by a second predetermined rotatory angle in the other direction to drive said sliding lever



so as to put back the same when said gear moving arm is rotated in the second direction, and wherein said disc pack receiving means is provided with an additional mechanical arrangement comprising a locking member for locking the disc pack on said disc pack receiving means, a driving lever for actuating the disc setting member in the disc pack, an additional motor for rotating selectively in first and second rotational directions opposite to each other, and a driving mechanism for causing said locking member to release the disc pack from lockup thereby on said disc pack receiving means when said additional motor rotates in the first rotational direction and for causing said driving lever to actuate the disc setting member when said additional motor rotates in the second rotational direction.

4,701,901

DISC PLAYER

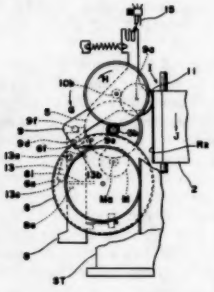
Nobuo Imai, Saitama, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jan. 22, 1986, Ser. No. 821,185

Claims priority, application Japan, Jan. 23, 1985, 60-10290; Mar. 13, 1985, 60-35536[U]

Int. Cl.[4] G11B *1/00, 23/02, 17/04, 25/04*

U.S. Cl. 369—75.2 **5 Claims**



1. In a disc player arranged to produce, through employment of an optical pick-up, signals recorded on a disc mounted on a turn table mounted for rotation on a slide table adapted to slide in a horizontal direction, said disc player comprising an electric motor serving as a driving source, a first transmission connected to said electric motor for sliding said slide table, a second transmission mechanism connected to said electric motor for driving said optical pick-up, and a pivotal member connecting said electric motor and said first transmission mechanism at a first position and for connecting said electric motor and said second transmission mechanism at a second position, said pivotal member being driven from said first position to said second position when said slide table is displaced to a reproducing position by said first transmission mechanism, with said disc clamped on said turn table, said motor being released from said connection with said second transmission mechanism when said pivotal member has been displaced to said first position, and being released from said connection with said first transmission mechanism when said pivotal member is displaced to said second position.

4,701,902

AUTOMATIC LOADING DISC PLAYER

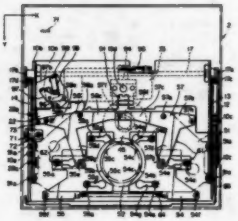
Yoshio Aoyagi; Toshiyuki Kimura; Susumu Niinuma; Minoru Yoshioka, all of Kawagoe; Fumihiko Yokogawa; Keiichi Matsumoto, both of Tokorozawa; Akira Haeno, Kawagoe; Takashi Sato, Kawagoe; Yoshiro Nishi, Kawagoe; Yoshihiko Watanabe, Kawagoe; Hiroyuki Hirano, and Youichi Ogawa, both of Tokorozawa, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 26, 1985, Ser. No. 727,780

Claims priority, application Japan, Apr. 27, 1984, 59-062301[U]; Apr. 27, 1984, 59-062302[U]; Apr. 27, 1984, 59-062303[U]

Int. Cl.[4] G11B *25/04*

U.S. Cl. 369—77.1 **2 Claims**



1. In an automatic disc player comprising disc playback means, a housing enclosing said disc playback means and having an elongated slot through which a disc is to be inserted into the housing and to be withdrawn from the housing, and a disc carrier means for conveying the disc in response to forward and reverse control signals between a playback position at which the disc is released onto said playback means and a withdrawl position at which the disc is ready to be withdrawn through said slot, said disc carrier means including a disc carrier member movable between said playback position and said withdrawl position, a driver for driving said disc carrier member from said withdrawl position to said playback position in accordance with said forward control signal and from said playback position to said withdrawl position in accordance with said reverse control signal, and a control circuit for supplying said forward control signal when it is triggered and reverse control signal when it detects a play completion of said playback means,

the improvement comprising:

resilient holding means associated with said disc carrier member for resiliently holding the disc in cooperation

with said disc carrier member so as to allow a slight movement of said disc relative to said disc carrier member;

a first detector for producing an eject completion signal when said disc carrier member takes said withdrawal position;

a second detector for producing a re-start signal when said disc slightly moves relative to said disc carrier member under the presence of said eject completion signal; and

an additional control circuit for supplying said forward control signal to said driver in response to said re-start signal.

4,701,903

AUTOMATIC RECORD PLAYER PICK-UP ARM CONTROL DEVICE HAVING MINIMAL HEIGHT

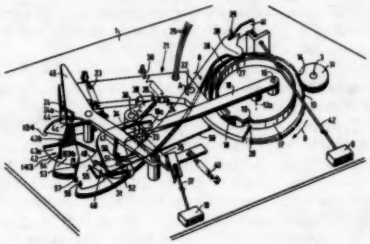
Hermanus F. Einhaus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 837,670, Mar. 10, 1986, abandoned, which is a continuation of Ser. No. 680,416, Dec. 11, 1984, abandoned. This application Nov. 3, 1986, Ser. No. 926,852

Claims priority, application Netherlands, Dec. 16, 1983, 8304334

Int. Cl.[4] G11B *3/10, 17/08*

U.S. Cl. 369—216 **31 Claims**



1. A record player having a turntable, a pick-up arm having a pick-up arm base and a control device for the pick-up arm, comprising

a command disc, and means for rotating said command disc,

a reciprocable drive element connected to said command disc and having an end remote from said command disc,

a guide element pivotally connected to said drive element at said end,

a coupling element on said pick-up arm base, arranged for engagement by said guide element to guide the pick-up arm towards the turntable,

an abutment coupled to said pick-up arm, and

a pivotal selection member having first and second positioning surfaces, arranged such that such surfaces are selectively cooperable with said abutment to position the pick-up arm selectively in a first or second position above the turntable,

characterized in that said abutment is arranged on the pick-up arm base,

said guide element is pivotable between an inoperative first stable position and an operative second stable position, said guide element being in said first position during a first movement of the reciprocable drive element, and in the second position during at least part of a return movement of said drive element opposite said first movement, said guide element being engageable with said coupling element to guide the pick-up arm when said guide element is in said second position only,

the device further comprises a stop disposed on said selection member, pivotal movement of said selection member moving said stop between an operative and an inoperative position; in said member operative position said guide element abutting said stop at the end of said first movement, abutment with said stop pivoting said guide element to the second position; and in the member inoperative position the stop being clear of said guide element,

means for pivoting said guide element out of said second position so as to disengage said guide element from said coupling element, during said return movement of the drive element after said abutment abuts the selected one of said positioning surfaces, and

means, responsive to movement of said command disc after the guide element has been disengaged from the coupling element, for pivoting said selection member to move the selected positioning surface out of the path of the abutment on the pick-up arm base.

4,701,904

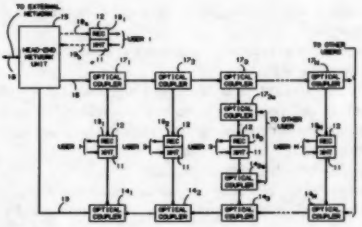
OPTICAL LOCAL AREA NETWORK EMPLOYING MICROWAVE MODULATION TECHNIQUES

Thomas E. Darcie, Hazlet, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 18, 1985, Ser. No. 788,953

Int. Cl.[4] H04B *9/00*; H04J *1/10*

U.S. Cl. 370—3 **7 Claims**



7. An optical communication system comprising

a plurality of transmitters each transmitter including (1) modulating means for selectively modulating a selected subcarrier signal with an input electrical information signal, received from a separate associated group of at least one user of the communication system, to place the electrical information signal into a selected subcarrier channel signal forming one of a plurality of N subcarrier channel signals, the selected subcarrier channel signal being arranged to include the entire information signal from the associated user group and lie in a separate non-overlapping portion of a predetermined system subcarrier frequency spectrum from that of the subcarrier channel signals from other transmitters which are currently active, and (2) an optical source for converting the selected subcarrier channel signal into a representative lightwave channel output signal which is then multiplexed with all other subcarrier channel output signals simultaneously transmitted by other active transmitters of the system;

lightwave propagating means for receiving and propagating the multiplexed lightwave output signal from the active ones of the plurality of transmitters; and

a plurality of receivers, each receiver being associated with a separate group of at least one user and comprising (1) photo detection means disposed to receive the multiplexed lightwave output signal propagating in the lightwave propagating means and converting the multiplexed lightwave signal into a corresponding multiplexed electrical signal, and (2) means for demodulating the multiplexed electrical output signal to recover a predetermined one of the multiplexed subcarrier channel signals for transmission to an associated user while rejecting all other channel signals forming a part of the received multiplexed lightwave output signal.

4,701,905

LOCAL AREA NETWORK SYSTEM UTILIZIING A CODE DIVISION MULTIPLE ACCESS METHOD

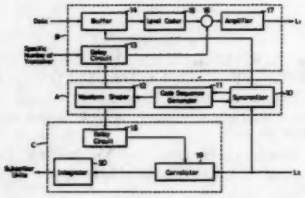
Chong K. Un, Seoul; Seung M. Ryu, Chungnam, and Chong R. Lee, Seoul, all of Rep. of Korea, assignors to Korean Advanced Institute of Science and Technology, Rep. of Korea

Filed Nov. 26, 1985, Ser. No. 801,720

Claims priority, application Rep. of Korea, Nov. 26, 1984, 7479/84

Int. Cl.[4] H04J *13/00*

U.S. Cl. 370—18 1 Claim



1. A code division multiple access local area network system comprising:

a repeater for generating a common synchronizing signal as a reference signal;

means for sending and receiving signals, said means for sending and receiving including a sending line and a receiving line for receiving data, each of said lines having an end connected to said repeater;

a plurality of subscriber units; and

a corresponding plurality of transceivers connecting each of said subscriber units to said means for sending and receiving signals;

each of said transceivers including a common synchronizing circuit, a transmitter and a receiver,

said common synchronizing circuit comprising means for replicating and regenerating a code sequence equal to said reference signal by synchronizing the code sequence in response to the reference signal of a maximal-length code sequence;

said transmitter comprising means for receiving said code sequence from said synchronizing circuit, means for delaying said code sequence according to a time determined by subtracting the entire time delay caused by said sending line and said receiving line from a delay time assigned to a specific receiver to which a signal is being sent, a level coder for converting data from said corresponding subscriber to M-ary data and providing an associated output signal, a multiplier connecting said level coder to said means for delaying said code sequence, for multiplying the delayed code from said means for delaying by said signal provided by said level coder to provide a multiplied signal, and an amplifier for amplifying said multiplied signal to provide an amplified signal, said transmitter transmitting said amplified signal to said sending line;

said receiver comprising means for receiving said code sequence from said synchronizing circuit, means for delaying said code sequence according to a delay time corresponding to a specific number assigned to said receiver, means for receiving data, a correlator for providing a correlation value of said code sequence delayed at said receiver and the received data, a detector for detecting signals for the receiver in accordance with the correlation value, and an integrator for integrating the detected signals,

whereby signals can be transmitted from each of said subscriber units simultaneously without interference.

4,701,906

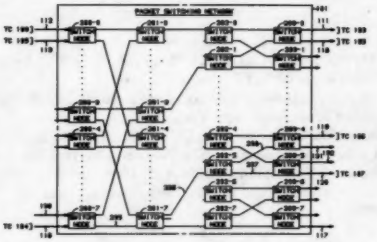
PACKET SWITCHING NETWORK WITH MULTIPLE PACKET DESTINATIONS

Maurice N. Ransom, Naperville, and Wing N. Toy, Glen Ellyn, both of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 27, 1985, Ser. No. 749,562

Int. Cl.[4] H04Q *11/04;* H04J *3/24*

U.S. Cl. 370—60 18 Claims



1. A multi-stage packet switching network for switching packets each comprising routing information, said network having switching stages each comprising a plurality of switch nodes, comprising:

said information comprises sets of signals in ordered significance with each set defining the routing through one of said stages of said network;

each of said nodes comprising means to decode a first type of said signals in the most significant set of said signals of a received packet for communicating said received packet to a switch node of a next sequential one of said stages;

said communicating means comprises means responsive to a second type of said signals in said most significant signal set for communicating said packet to a plurality of said nodes in said next sequential stage; and

means responsive to a third type of signals in said most significant signal set for modifying said route information to communicate said packet to a plurality of said switch nodes in said next sequential stage upon modifying said routing information as defined by said most significant signal set.

4,701,907

DYNAMICALLY RECONFIGURABLE TIME-SPACE-TIME DIGITAL SWITCH AND NETWORK

Arthur A. Collins, Dallas, Tex., assignor to Arthur A. Collins, Inc., Dallas, Tex.

Filed Feb. 3, 1986, Ser. No. 825,394

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—63 3 Claims

1. A dynamically reconfigurable time-space-time switching system for use in conjunction with a high speed transmission media which conveys a plurality of channels of data within a repeated frame, comprising:

a plurality of digital switching units each connectable to said transmission media and comprising;

a first line terminating unit connected to receive said channels of data from said high speed transmission media;

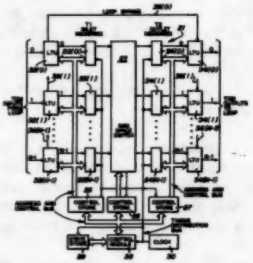
a TST switch connected to receive said channels of data from the first line terminating unit at the inlet ports thereof;

a second line terminating unit connected to receive said channels of data from the outlet ports of said TST switch and transfer said channels of data to said high speed transmission media for transmission to another one of said switching units;

a programmable fractional divider connected to clock said second line terminating unit;

the frames of said channels of data having at least one timing adjustment interval; and

means for measuring at least one timing adjustment interval within frames of said channels of data received at said first line terminating unit from said other switching unit, and



for transmitting a control command to said other switching unit to adjust the rate of a counter at said other switching unit as a function of said measured timing adjustment interval, whereby said timing adjustment interval is maintained within a predetermined range.

4,701,908

NETWORK SYSTEM UTILIZING PLURAL STATION ADDRESSES

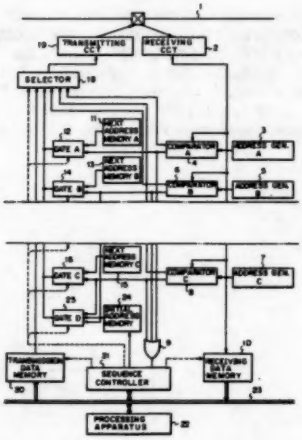
Toshio Ikeda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1985, Ser. No. 742,906

Claims priority, application Japan, Jun. 22, 1984, 59/127269; Jun. 22, 1984, 59/127272

Int. Cl.[4] H08J *3/00;* **H04J** *3/16*

U.S. Cl. 370—85 **14 Claims**



1. A network system including a plurality of nodes, each having an associated address, connected to each other through a communication medium, wherein only a node to which a communication right has been assigned is permitted to perform data transmission between that node and another node and the communication right is assigned by a command with a destination address to another node having an associated address coinciding with the destination address, and wherein a particular node among said plurality of nodes comprises:

means for providing a particular address different from said associated address;

means for obtaining the communication right upon receipt of the command with the destination address coinciding with one of said associated address and said particular address; and

means for assigning the communication right, said assigning means being operable, in a case where said obtaining means obtained the communication right upon receipt of the command with the destination address coinciding with said particular address, to assign the communication right to a specific node, and in a case where said obtaining means obtained the communication right after assignment of the communication right to the specific node, to assign the communication right to a second node having one of an associated address and a particular address which is associated with said particular address of said specific node.

4,701,909

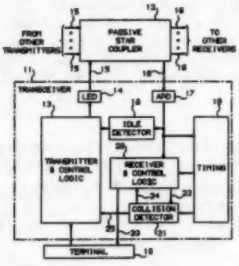
COLLISION DETECTION TECHNIQUE FOR AN OPTICAL PASSIVE STAR LOCAL AREA NETWORK USING CSMA/CD

Mohsen Kavehrad, Holmdel, and Carl-Erik Sundberg, Hazlet, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 24, 1986, Ser. No. 888,699

Int. Cl.[4] H04J *3/02;* **G06F** *11/00*

U.S. Cl. 370—85 **13 Claims**



1. A collision detection arrangement for use in a receiver of a Carrier Sense Multiple Access Collision Detection (CSMA/CD) communication network transceiver, the arrangement comprising:

an input terminal for receiving a signal from the network including a packet of information which was originally transmitted comprising a preamble section including a collision detection sequence of length N bit intervals and a predetermined Hamming weight, where each transceiver of the network is assigned a separate collision detection sequence;

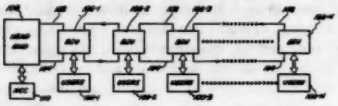
means responsive to a collision detection sequence received at the input terminal for determining the Hamming weight of the collision detection sequence and for generating an output signal representative of such weight; and

means responsive to the output signal from the determining and generating means for comparing the Hamming weight of the received collision detection sequence with a predetermined threshold Hamming weight and for generating an output signal indicative of a collision of packets of information when the Hamming weight determination exceeds the threshold Hamming weight.

4,701,910
RELIABLE LOCAL AREA NETWORK INCLUDING ACTIVE STATIONS

Mehmet E. Ulug, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 29, 1985, Ser. No. 802,809
Int. Cl.[4] H04J 3/02, 1/16
U.S. Cl. 370—85 11 Claims



1. A local area network wherein protection is provided against an open transmit channel, comprising:

a primary receive channel, a primary transmit channel and an auxiliary transmit channel;

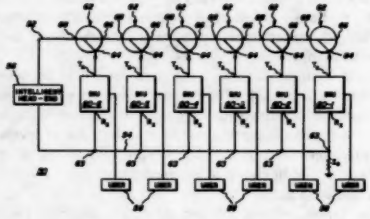
head end means for receiving message signals from said auxiliary and said primary transmit channels and transmitting these message signals over said receive channel; and

a plurality of bus interface unit (BIU) means each serially coupled to said primary transmit channel to receive message signals from a predecessor BIU and transmit these message signals to a successor BIU over said primary transmit channel such that each transmitted message signal is received by said head end means, each said BIU means being also coupled to receive each message signal transmitted by said head end means via said receive channel, each said BIU means being adapted to detect whether said primary transmit channel is open circuited by determining whether a message signal has been received thereover from its predecessor BIU within a first predetermined network transmit interval and, if not, to reestablish communications by transmitting a transmit control signal addressed to its predecessor, its predecessor being responsive to said transmit control signal to transmit message signals over said auxiliary transmit channel.

4,701,911
MEDIA ACCESSING APPARATUS AND METHOD FOR COMMUNICATION SYSTEM

Mehmet E. Ulug, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,439
Int. Cl.[4] H04J 3/02, 3/24
U.S. Cl. 370—85 45 Claims



1. A bus communication system, comprising:

a transmit bus;

a receive bus;

means for directing signals leaving said transmit bus onto said receive bus;

a plurality of bus interface units (BIU) respectively coupled between said transmit and receive buses at locations spaced therealong, said BIUs communicating with one another by transmitting signals on said transmit bus and receiving signals on said receive bus, each said BIU being coupled to a user device for which it both transmits and receives information packets;

said directing means including means for intermittently transmitting a startup packet on said receive bus, each said BIU receiving said startup packet at a time determined by the signal propagation time along said receive bus;

said startup packet initiating a propagation period having a duration at least equal to the time for a signal to propagate from a remote end of said transmit bus to a remote end of said receive bus;

each said BIU having an information packet to transmit being in a transmit state;

each said BIU including:

means for transmitting a ready signal while in the transmit state upon receipt of said startup packet during said propagation period, each said transmit state BIU receiving said ready signals in a sequence determined by the signal propagation time along said transmit and receive buses;

means for recognizing upon receipt the ready signal transmitted thereby as a principal ready signal; and

means for determining a transmission ranking, while in said transmit state, from the position of the principal ready signal in the sequence of the received ready signals;

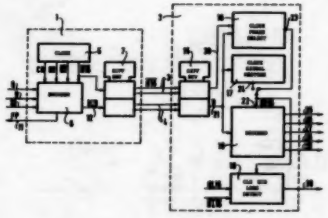
a first ranked transmit state BIU commencing transmission of its information packet following said propagation period, the other transmit state BIUs transmitting their respective information packets in a sequence according to their respective transmission rankings following said first ranked BIU completing transmission of its information packet; and

each said BIU upon completing transmission of its information packet entering a captive mode during which transmission of its information packets is precluded, said captive mode extending until completion of a subsequent propagation period during which no BIU in said system transmits said ready signal.

4,701,912
DEVICE FOR TRANSMITTING PACKETS IN AN ASYNCHRONOUS TIME-DIVISION NETWORK, AND METHOD OF ENCODING SILENCES

Serge Bueno, Bondoufle, and Philippe Bourbon, Meudon la Foret, both of France, assignors to Alcatel, Paris, France

Filed Aug. 6, 1986, Ser. No. 893,744
Claims priority, application France, Aug. 7, 1985, 85 12092
Int. Cl.[4] H04J 3/24, 3/00
U.S. Cl. 370—94 10 Claims



1. Method of encoding silences separating packets in a packet transmission system in which each packet comprises half-bytes of data delivered by a Manchester code transmitter and addressed to a receiver, in which method the transmitter delivers, during the silences and alternately, two types of empty half-byte which are mirror images of each other and each comprise four bits of alternating values, and only the third

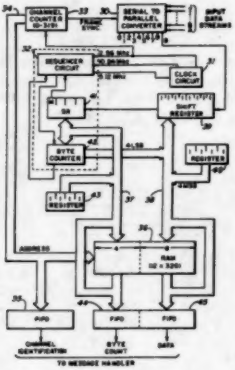
and fourth bits of each empty half-byte comprise a median transition according to the Manchester code, an empty half-byte of a first type having a first bit of level **0**, a second bit of level **1**, a third bit of value **0** and a fourth bit of value **1**, an empty half byte of a second type having a first bit of level **1**, a second bit of level **0**, a third bit of value **1** and a fourth bit of value **0**.

4,701,913

CIRCUIT AND METHOD FOR EXTRACTING SIGNALLING INFORMATION EMBEDDED IN CHANNELIZED SERIAL DATA STREAMS

Paul G. Nelson, Carrollton, Tex., assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 11, 1986, Ser. No. 872,841
Int. Cl.[4] H04J *3/12*
U.S. Cl. 370—110.1 **14 Claims**



1. A demultiplexer circuit for extracting variable length signalling messages embedded in a channelized serial data stream having a frame format comprising a plurality of channels each having a plurality of bits one of which is a signalling bit, the signalling message format comprising a signalling message header having a start bit and a length field defining the number of bytes in the message, the circuit comprising:

a circuit for providing a clock signal for every channel time,

a read-write memory having a plurality of locations at least as large as the number of channels in a frame of the serial data stream, each location having at least the number of cells necessary to store a byte of signalling data and the signalling message header,

a serial to parallel converter circuit for receiving the serial data stream and responsive to clock signals for sequentially outputting the signalling bits from consecutive channels of the data stream,

a first shift register for receiving the signalling bits from the channels of data, for serially outputting a bit for each signalling bit received and for outputting in parallel to the memory a byte of signalling bits, and

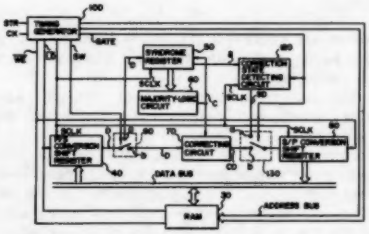
a control circuit including a second register adapted to receive serial data from the first register and output its content to the memory, the control circuit being responsive to the serial output bits from the first register for recognizing a signalling message header, full bytes of signalling data and the end of a signalling message, the control circuit also including a sequencer circuit responsive to clock signals for providing timing control signals whereby for each signalling bit outputted from the serial to parallel converter, the content of the memory location associated with the channel of that bit is read into the first and second registers, the signalling bit is shifted laterally into the first register and the contents of the first and second registers is written back into the same memory location.

4,701,914

APPARATUS FOR CORRECTING CYCLIC CODE DATA STORED IN MEMORY AND METHOD THEREFOR

Akira Matsushita, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 26, 1985, Ser. No. 780,605
Claims priority, application Japan, Sep. 26, 1984, 59-199651; Sep. 28, 1984, 59-201915
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—13 **10 Claims**



1. An apparatus for error correction, comprising:

data storing means including first and second storage areas, the first storage area storing uncorrected code data as a data packet, the data packet having a data field and an error correction field including a predetermined number of bits;

timing signal generating means for generating first and second timing signals, said second timing signal being generated a predetermined interval of time after said first timing signal;

data readout means for reading the uncorrected data from the first storage area of the data storing means in response to the first and second timing signals, the uncorrected data being successively read out in predetermined increments of bits;

switching means for switching between first and second lines, the first line for transmitting the uncorrected data read out in response to the first timing signal, and the second line for transmitting the uncorrected data read out in response to the second timing signal;

error syndrome calculating means for calculating data errors in the uncorrected data transmitted through the first line and for generating an output representing the data errors;

error detecting means for determining whether the uncorrected data includes a predetermined quantity of data errors based on the output of the error syndrome calculating means and for generating correction data representing a result of the determination;

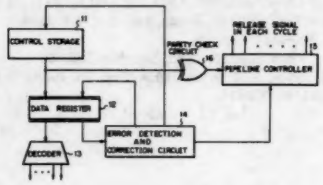
correction means for synchronously fetching the correction data generated by the error detecting means and the uncorrected data transmitted through the second line and for correcting errors in the uncorrected data in accordance with the correction data to thereby generate corrected data; and

write means for successively writing the corrected data into the second storage area of the data storing means in said predetermined increments of bits.

4,701,915
ERROR RECOVERY SYSTEM IN A DATA PROCESSOR HAVING A CONTROL STORAGE

Toshiaki Kitamura, and Yuji Oinaga, both of Tokyo, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 7, 1985, Ser. No. 763,268
Claims priority, application Japan, Aug. 18, 1984, 59-171759
Int. Cl.[4] G06F *11/10*; G11C *29/00*
U.S. Cl. 371—13 **12 Claims**



1. An error recovery system in a data processor of the pipeline type having a plurality of pipeline stages and a control storage, comprising:

control storage means for storing instruction data, having a code for the detection and correction of errors, and for controlling said data processor;

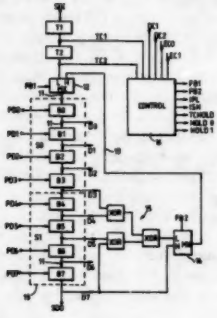
check circuit means for checking instruction data read from said control storage means and upon the detection of an error during said checking, stopping the pipeline processing of a stage being processed at the time the error occurred along with prior stages, and allowing processing of stages subsequent to the stage containing the error to continue; and

error detection circuit means for correcting the error in the read instruction data and rewriting the instruction data into said control storage while the pipeline process stages are stopped.

4,701,916
DIGITAL INTEGRATED CIRCUIT WITH MULTI-MODE REGISTER

Finbar Naven, Cheadle Hulme, and Stuart G. Hale, Denton, both of Great Britain, assignors to International Computers Limited, London, England

Filed Mar. 17, 1986, Ser. No. 840,602
Claims priority, application United Kingdom, Mar. 23, 1985, 8507612; Jul. 25, 1985, 8518857
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—15 **6 Claims**



1. A digital integrated circuit comprising:

(a) a register having a plurality of modes of operation, the register having at least one control input for selecting said modes, a serial data input, and a serial data output,

(b) external input and output terminals, and

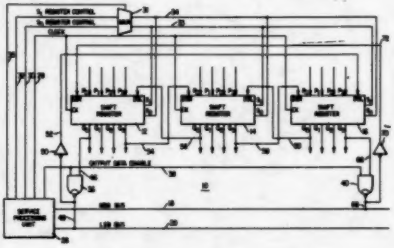
(c) a serial shift path connected between said external terminals, the register being connected in series in said serial path by means of said serial data input and serial data output, wherein the improvement comprises:

(d) at least one control bit cell having a serial data input and a serial data output, the control bit cell being connected in series in said serial shift path by means of said serial data input and serial data output of the control bit cell, and the serial data output of the control bit cell being connected to said control input of the register.

4,701,917
DIAGNOSTIC CIRCUIT

Thomas M. Jones, 6050 Glen Heather, Dallas, Tex. 75252, and David M. Chastain, 1208 Serenade Cir., Plano, Tex. 75075

Filed Jun. 20, 1984, Ser. No. 622,450
Int. Cl.[4] G06F *11/00*; G01R *31/28*
U.S. Cl. 371—16 **8 Claims**



1. A diagnostic circuit for exchanging test data with a plurality of registers, comprising:

first and second bidirectional, serial buses;

said plurality of registers connected in series to shift data therethrough for both left and right shifts, said registers connected together in a group to have a first register and a last register;

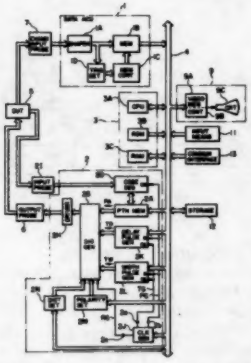
first means connected to said first bus, said first register and said last register, said first means operative in resopnse to an externally supplied first enable command for serially transferring data held in said registers from said first register to said first bus for transmission therethrough and to an input of said last register for recirculating the data back into said registers, and said first means operative in response to an externally supplied second enable command for serially transferring data from said first bus through one of said registers for placing data into said registers; and

second means connected to said first bus, said first register and said last register, said second means operative in response to said first enable command for serially transferring data held in said registers from said last register to said second bus for transmission therethrough and to an input of said first register for recirculating the data back into said registers, and said first means operative in response to said second enable command for serially transferring data from said second bus into said registers; wherein the data transferred between saids buses and said registers reflects the functional state of said registers.

4,701,918
LOGIC ANALYZER

Takayuki Nakajima, Gyoda; Tetsuo Aoki, Kohnosu; Katsumi Kobayashi, Gyoda, and Noboru Akiyama, Kumagaya, all of Japan, assignors to Takeda Riken Kogyo Kabushikiknisha, Tokyo, Japan

Filed May 24, 1985, Ser. No. 737,467
Claims priority, application Japan, May 28, 1984, 59-108919; May 28, 1984, 59-108920
Int. Cl.[4] G01R *31/28;* G06F *11/00*
U.S. Cl. 371—20 3 Claims



1. A logic analyzer for a circuit under test, producing as outputs, one of a circuit delay time and circuit pulse width based on groups of test pattern waveform signals supplied as an input to channels of the circuit and receiving from an external source selective data representing at least one of an input delay time relative to a reference timing and an input pulse width defining test conditions for each group of test pattern waveforms, comprising:

first memory means for sequentially storing the outputs of the circuit;

second memory means for storing pattern data and a program in address locations for generation of successive test patterns to be applied to the circuit;

input means for receiving as an input, from the external source, the selective data;

third memory means for storing the selective data;

a pattern generator, connected to said second memory means, said third memory means and the circuit, for generating test pattern waveform signals, based on a pattern generation clock signal, with a pattern delay time and a pattern pulse width corresponding to the selective data and for supplying the test pattern waveform signals to the input channels of the circuit;

code generating means, connected to said input means, for receiving from said input means the selective data, and generating addresses and character codes representing characters and graphic pattern segments to be displayed, said graphic pattern segments including a parallel-bar segment, a high level bar segment, a low level bar segment, a rising bar segment, a falling bar segment, and a cross-bar segment where the segments are used to represent the pattern delay time and pattern pulse width; and

a display unit connected to said code generating means for receiving from said code generating means the character codes, and for displaying said delay time and pulse width data as both characters and graphic patterns for each of test patterns corresponding to said test pattern waveform signals, said display unit comprising:

a scanning type display having a screen and for selectively displaying on the screen thereof the conditions of Cthe test to be conducted and successive outputs from the circuit under test in characters, symbols and waveforms;

a video memory, connected to said code generating means, for storing the character codes of the characters and graphic pattern segments at said addresses corresponding to display positions on the screen of said scanning type display where the characters and graphic pattern segments are to be displayed;

display pattern generator means connected to said scanning type display, having stored therein dot patterns of the characters and graphic pattern segments at addresses corresponding to their character codes and for reading out therefrom the dot patterns of the characters and graphic pattern segments for display on the screen; and

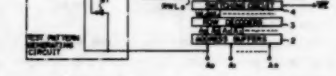
readout means, connected to said scanning type display, said display pattern generator means and said video memory, for sequentially reading out the character codes from said video memory in synchronism with scanning of said scanning type display and supplying the readout character codes as addresses to said display pattern generator means; and

said code generating means, video memory means, readout means, display pattern generator means and scanning type display being interconnected to display the waveforms corresponding to the test conditions as a succession of the graphic pattern segments and the test conditions being displayed in characters in association with the corresponding waveforms on the screen of said scanning type display.

4,701,919
SEMICONDUCTOR DEVICE INCORPORATING MEMORY TEST PATTERN GENERATING CIRCUIT

Mitsugu Naitoh, and Yoshiyuki Suehiro, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 18, 1985, Ser. No. 810,143
Claims priority, application Japan, Dec. 20, 1984, 59-267460
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—21 6 Claims



1. A semiconductor device comprising:

a memory cell array accessed by address signals;

a test pattern generating circuit means for generating test pattern data in response to receiving and logically processing a part of said address signals and a control signal, wherein the pattern of said data is changed in accordance with change of said part of said address signals; and

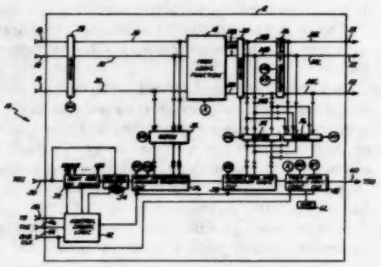
a selector operatively connecting said memory cell array and said test pattern generating circuit means, wherein said test pattern data is transmitted through said selector to said memory cell array in a test mode.

4,701,920

BUILT-IN SELF-TEST SYSTEM FOR VLSI CIRCUIT CHIPS

David R. Resnick, Shoreview, and Randall E. Bach, Stillwater, both of Minn., assignors to ETA Systems, Inc., St. Paul, Minn.

Filed Nov. 8, 1985, Ser. No. 796,598
Int. Cl.[4] G01R 31/28
U.S. Cl. 371—25 30 Claims



25. An LSI circuit, including;

main logic function means for performing digital logic operations; and

built-in test system means interconnected to the main logic function means for performing dynamic tests of main logic function means operation, the built-in test system means including:

test data input means for receiving test data in a serial format;

system clock input means for receiving a system clock signal which switches between first and second logic states;

test strobe input means for receiving a test strobe signal;

test clock enable input means for receiving a test clock enable signal;

test strobe latch means responsive to the test strobe input means and the system clock input means for producing a latched test strobe signal by latching a logic state of the test strobe signal on transitions of the system clock signal;

test clock enable latch means responsive to the test clock enable input means and the system clock input means for producing a latched test clock enable signal by latching a logic state of the test clock enable signal on transitions of the system clock signal;

first logic gate means responsive to the test strobe latch means, the test clock enable latch means, and the system clock means, for gating the latched test strobe signal and the latched test clock enable signal with the system clock signal and producing a control register clock signal;

second logic gate means responsive to the test clock enable latch means and the system clock input means for gating the latched test clock enable signal with the system clock signal and producing a shift register clock signal;

control register means responsive to the test data input means and the first logic gate means for serial test data transfer when clocked by the control register clock signal, and for producing test system means control signals, the control register means comprising static flip-flops interconnected in a series arrangement; and

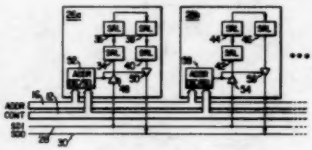
shift register means responsive to the control register means, the second logic gate means, and the main logic function means for serial test data transfer with the cotnrol register means, and for parallel test data transfer with the main logic function means, when clocked by the shift register clock signal, the shift register means comprising a plurality of static flip-flops interconnected in a series arrangement.

4,701,921

MODULARIZED SCAN PATH FOR SERIALLY TESTED LOGIC CIRCUIT

Theo J. Powell, Dallas, and Yin-Chao Hwang, Sugar Land, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 23, 1985, Ser. No. 790,541
Int. Cl.[4] G01R 31/28
U.S. Cl. 371—25 16 Claims



1. A testable logic circuit, comprising:

a plurality of modules each having a defined test boundary, each of said modules comprising:

internal logic circuitry;

control/observation means disposed at a plurality of control/observation locations within said internal logic circuitry for applying test vectors to said control/observation locations within said internal logic circuitry, and for storing results at said control/observation location;

serial means for interconnecting said control/observation means in a serial chain, said serial means having a test input and a test output; and

interface means for connecting said test input of said serial means to a serial input terminal for receiving test vectors from the exterior of the logic circuit and for selectively connecting said test output of said serial means to a serial output terminal for outputting results after testing to the exterior of the logic circuit; and

address means for selecting one of said modules in accordance with an external module address signal and for controlling the interface means in said selected one of said modules to connect said test output of said serial means associated with said selected module to said serial output terminals

so that vectors may be applied to said control/observation locations of said associated internal logic circuitry and so that results of the operation of said internal logic circuitry stored at said control/observation locations after said test vectors have been applied may be output.

4,701,922

INTEGRATED CIRCUIT DEVICE

Shigeo Kuboki, Nakaminato; Ikuro Masuda, Hitachi; Toshishi Masuda, Kitaibaraki, and Terumine Hayashi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Hitachi, both of, Japan

Filed Aug. 26, 1985, Ser. No. 769,311
Claims priority, application Japan, Sep. 4, 1984, 59-185242
Int. Cl.[4] G01R 31/28
U.S. Cl. 371—25 13 Claims

1. An integrated semiconductor circuit device comprising:

a combinational circuit group;

a sequential circuit group coupled to inputs of the combinational circuit group, wherein each sequential circuit within said sequential circuit group comprises:

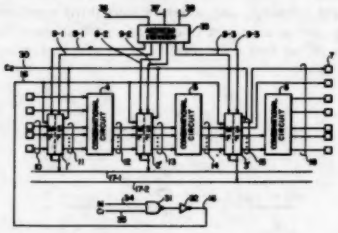
a master flip-flop circuit;

a slave latch circuit;

input terminals to receive a main input signal;

a common input control signal terminal coupled to means within said sequential circuit to conrol entry of the main input signals into said sequential circuit;

a test data terminal coupled to means within said sequential circuit to provide a testing function for said sequential circuit;



a read terminal and/or a write terminal coupled to means within said sequential circuit for controlling transfer of test data generated in said sequential circuit during said testing function; and

a latch signal terminal coupled to means within said sequential circuit for providing a shift clock to said sequential circuit to scan-out said test data.

4,701,923

ADAPTIVELY CODED DATA COMMUNICATION SYSTEM WITH HALF DUPLEX AND/OR FULL DUPLEX FUNCTION

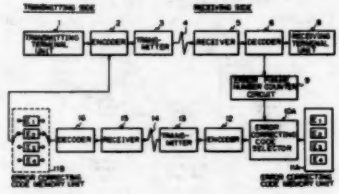
Atsushi Fukasawa; Takuro Sato; Haruhiko Akiyama, and Manabu Kawabe, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1986, Ser. No. 818,825

Claims priority, application Japan, Jan. 14, 1985, 60-3381; Jan. 17, 1985, 60-5009

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—41 **1 Claim**



1. A adaptively coded data communication system with half duplex and/or full duplex function comprising a transmitting side unit and a receiving side unit;

(1) said transmitting side unit including;

(a) a source of input information data;

(b) a means for providing encoding codes of different types with different redundancies;

(c) a means for detecting a ratio of error frames to total frames according to error frame numbers transmitted from said receiving side unit, and for selecting one type of encoding code according to an initial state or said ratio of error frames;

(d) a means for encoding said input information data and information data of said error frame numbers for each frame unit with a frame number, and for combining a plurality of frames together into a block with a number of said selected types of encoding codes; and

(e) a transmitter for transmitting said encoded data to said receiving side unit;

(2) a receiving side unit including;

(a) a receiver for receiving data transmitted from said transmitting side unit;

(b) a decoder for decoding an output from said receiver using said encoding code of said selected type number, and detecting frame numbers of error frames from decoded codes of said output from said receiver; and

(c) a transmitter for transmitting said frame numbers of said error frames to said transmitting side unit.

4,701,924

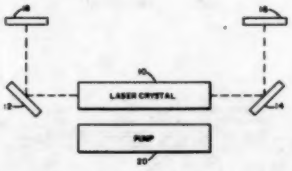
FREQUENCY DISCRIMINATING LASER

Michael D. Thomas, Hudson, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 15, 1985, Ser. No. 765,744

Int. Cl.[4] H01S *3/098, 3/10*

U.S. Cl. 372—19 **5 Claims**



1. A laser for discriminating between a higher gain transition and a lower gain transition to permit the laser to lase at the lower gain transition, comprising:

a laser cavity, including more than two mirrors each of which is highly transmissive at the frequency of the higher gain transition, one of which is partially reflective at the frequency of the lower gain transition, and all but said one of which are highly reflective at the frequency of the lower gain transition;

an active laser medium disposed within said cavity; and

means for pumping said active laser medium.

4,701,925

ELECTRIC CONTROL SYSTEM FOR A METAL ION LASER

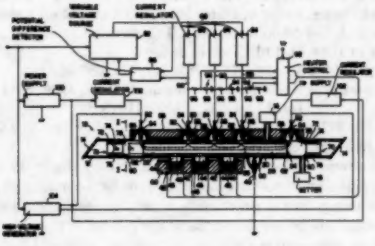
Akira Fuke; Yasuhiro Tokita, and Katsuhiko Masuda, all of Shizuoka, Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1986, Ser. No. 888,452

Claims priority, application Japan, Jul. 22, 1985, 60-160079

Int. Cl.[4] H01S *3/00*

U.S. Cl. 372—38 **5 Claims**



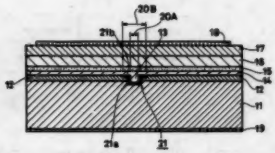
1. An electric control system for a metal ion laser of the type

having anode means open to the interior of a hollow cathode, metal chamber means also open to the interior of the hollow cathode and containing a metal material to be vaporized, and a heater for heating the metal chamber means in order to vaporize the metal material contained therein, the electric control system comprising constant current supply means connected to supply an output voltage thereof to the anode means for supplying a constant current thereto, and heater control means, connected between the constant current supply means and the heater, for controlling the magnitude of a current fed to the heater so as to maintain at a predetermined magnitude an output voltage of the constant current supply means to thereby stabilize the laser output.

4,701,926
LASER DIODE

Yoshito Seiwa, and Saburo Takamiya, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1986, Ser. No. 837,358
Claims priority, application Japan, Mar. 27, 1985, 60-65715
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **8 Claims**



1. In a laser diode:

a semiconductor substrate of a first conductivity type;

a current constricting layer of a second conductivity type formed with a slit over said substrate, wherein said slit is opened through said constricting layer and separates said constricting layer into two areas;

a liner formed on at least both the inner side walls of said slit, wherein said liner is of the same material as said constricting layer but of the first conductivity type;

a lower clad layer of the first conductivity type formed over said constricting layer, burying said slit;

an active layer of the first conductivity type which is formed over said lower clad layer and has a refractive index higher than that of said lower clad layer; and

an upper clad layer of the second conductivity type which is formed over said active layer and has a refractive index lower than that of said active layer.

4,701,927
LIGHT EMITTING CHIP AND OPTICAL COMMUNICATION APPARATUS USING THE SAME

Hiroshi Naka, Komoro; Ichiro Seko, Takasaki; Shuji Kobayashi, Isezaki, and Makoto Haneda, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 25, 1985, Ser. No. 695,005
Claims priority, application Japan, Jan. 25, 1984, 59-10008
Int. Cl.[4] H01L *33/00*; H01S *3/19*
U.S. Cl. 372—46 **9 Claims**

1. In a light emitting chip comprising:

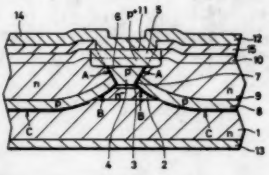
(1) a semiconductor substrate of a first conductivity type;

(2) a first semiconductor layer of a the first conductivity type coming into contact with a part of said semiconductor substrate of the first conductivity type;

(3) an active layer coming into contact with said first semiconductor layer of the first conductivity type and having side surfaces;

(4) a second semiconductor layer of a second conductivity type coming into contact with said active layer;

(5) a third semiconductor layer of the second conductivity type, coming into contact with a part of said semiconductor substrate of the first conductivity type, wherein said third semiconductor layer has an opening which includes a neck portion defining a point of intersection between an end surface of said third semiconductor layer at said opening and a bottom surface of said third semiconductor layer at said opening, and wherein said third semiconductor layer interposes a part of each of said first semiconductor layer of the first conductivity type, said active layer and



said second semiconductor layer of the second conductivity type at said opening; and

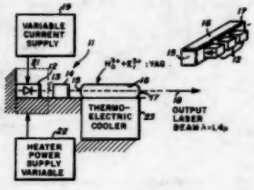
(6) a fourth semiconductor layer of the first conductivity type coming into contact with said third semiconductor layer of the second conductivity type, wherein said fourth semiconductor layer includes an opening and interposes a portion of said second semiconductor layer of the second conductivity type at said opening,

wherein said side surfaces of said active layer are positioned below said neck portion to contact said bottom surface of said third semiconductor layer at said opening of said third semiconductor layer.

4,701,928
DIODE LASER PUMPED CO-DOPED LASER

Tso Y. Fan, and Robert L. Byer, both of Stanford, Calif., assignors to Board of Trustees, Leland J. Stanford University, Stanford, Calif.

Filed Oct. 2, 1985, Ser. No. 782,880
Int. Cl.[4] H01S *3/14, 3/091*
U.S. Cl. 372—68 **20 Claims**



1. In a laser apparatus:

optical pumping means including a laser diode for emitting coherent optical pumping radiation at a narrow band resonant wavelength;

laser gain medium means disposed to receive the pumping radiation and including a host material doped with a first concentration of a first lasant ion for emitting output coherent optical radiation of an output wavelength from a certain lasant energy level transition; and

said laser gain medium host material also being doped with a second concentration of a second ion for absorbing the narrow band coherent optical pumping radiation produced by said laser diode and for transferring energy absorbed from said narrow band pumping radiation to said first lasant ion for inverting the population density of said

certain lasant energy levels of said first ion from which lasant energy transitions at an output wavelength are obtained.

4,701,929

LASER DIODE PUMPED SOLID STATE LASER

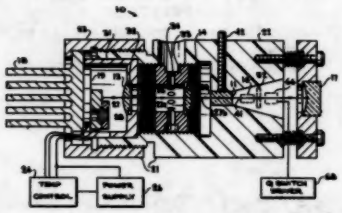
Thomas M. Baer, Mountain View, and Mark S. Keirstead, San Jose, both of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Continuation of Ser. No. 811,546, Dec. 19, 1985, which is a continuation-in-part of Ser. No. 730,002, May 1, 1985. This application Mar. 24, 1987, Ser. No. 29,836

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—71 20 Claims



1. A high efficiency, laser diode pumped, compact solid state laser, comprising:

a rare earth doped solid laser rod having a front end and a back end;

a housing with means holding the laser rod in fixed position in the housing with its front end forward;

a laser diode secured in the housing behind and in optical alignment with the rod, said diode being focused on the back end of the rod for pumping the rod, said diode having an output frequency which is absorbed by the rare earth to excite the laser rod;

laser cavity means defining a laser cavity mounted in the housing with the rod in the cavity, the laser cavity means including output coupler means;

means for matching inside the laser rod an image of the laser diode with a lasing beam volume of the laser cavity.

4,701,930

DISTRIBUTED FEEDBACK SEMICONDUCTOR LASER

Shigeyuki Akiba, Tokyo; Katsuyuki Utaka, Musashino; Kazuo Sakai, Tokyo, and Yuichi Matsushima, Tanashi, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

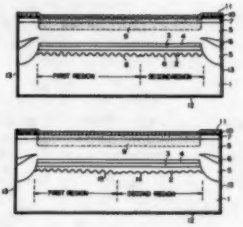
Filed Aug. 9, 1985, Ser. No. 764,217

Claims priority, application Japan, Aug. 15, 1984, 59-170143

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—96 3 Claims

1. A distributed feedback laser having a substrate, a DFB portion on said substrate comprising a light emitting layer and an adjoining layer having periodic corrugations extending in the direction of travel of light, and electrodes for effecting laser oscillations, a first DFB region and a second DFB region of said DFB portion contiguous with said first DFB region having laser light outputs asymmetrical in magnitude, the first DFB region and the second DFB region having means comprising the periodic corrugations therein for making Bragg reflections of the first DFB region different from the second DFB region so that said laser light outputs thereof are asymmetrical in magnitude, and the periodic corrugations having a phase shift between the first DFB region and the second DFB region by a value corresponding to one fourth of the wavelength of light.



4,701,931

ELECTRICALLY CONDUCTIVE BRICKS

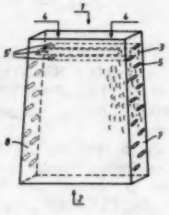
Bo Rappinger, and Sven-Einar Stenkvist, both of Västerås, Sweden, assignors to ASEA AB, Västerås, Sweden

Filed Dec. 2, 1986, Ser. No. 936,810

Claims priority, application Sweden, Dec. 2, 1985, 8505659

Int. Cl.[4] F27D *1/004*

U.S. Cl. 373—72 6 Claims



1. An electrically conductive brick containing a refractory filler material and electrically conductive elongate particles, the bricks being formed by pressing the filler material and conductive particles into a desired shape for the brick, wherein a plurality of passages each having a longitudinal direction and none of which pass completely through the brick, are arranged in the brick, each said passage extending in its longitudinal direction substantially perpendicular to the elongate direction of the conductive particles.

4,701,932

METHOD FOR REGULATING THE ELECTRODES IN A FURNACE HAVING FREELY BURNING ELECTRIC ARCS

Karlheinz Bretthauer, and Hans-Dietrich Obenauf, both of Clausthal-Zellerfeld, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 3, 1986, Ser. No. 847,923

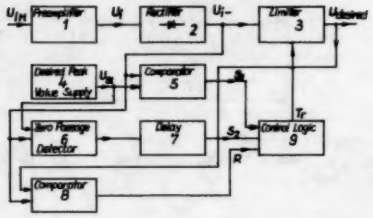
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512178

Int. Cl.[4] H05B *7/148*

U.S. Cl. 373—104 7 Claims

1. In a method for regulating the electrodes in a three-phase melting furnace operating with freely burning electric arcs in dependence on the arc voltages, and with each electrode having an associated arc voltage regulator which receives the arc voltage as the actual value and a desired arc voltage value and

which produces a regulating value therefrom, said method including determining the respective arc voltages from the phase voltages and the active and reactive voltage drops across the respective high current lines, and feeding the respectively determined arc voltage values and the associated desired arc voltage values to the associated regulators; the improvement comprising forming the respective said desired arc voltage



values by: providing a voltage which is proportional to the actual arc current; providing a limit value corresponding to a desired arc length; and, during each half wave of the said arc current proportional voltage, utilizing the smaller of the momentary value, with respect to magnitude, of said arc current proportional voltage and of said limit value as said desired arc voltage value which is fed to the associated arc voltage regulator.

4,701,933

METHOD OF SUPPLYING HEAT ENERGY TO A METAL MELT OR THE LIKE AND A HEATING ELEMENT FOR USE WITH SAID METHOD

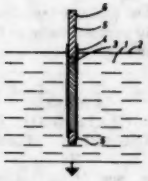
Cato Evensen, Fredrikstad, Norway, assignor to Scantherm A/S, Fredrikstad, Norway

Filed Jan. 6, 1986, Ser. No. 816,216

Claims priority, application Norway, Feb. 11, 1985, 850507; Jul. 11, 1985, 852786

Int. Cl.[4] H05B *3/10*

U.S. Cl. 373—117 **8 Claims**



1. A method for supplying heat only to a metal melt, comprising the steps of:

(a) providing a metal melt;

(b) supplying a core which is composed of an electrically resistive material which is capable of withstanding temperatures exceeding the melting point of a metal to which heat is to be supplied;

(c) providing a means for conducting electricity to said core;

(d) providing a means for conducting electricity from same core;

(e) coating said core with a coating which is electrically insulating and which has a relatively high heat conducting capacity; and

(f) immersing said core of step (e) in the metal melt.

4,701,934

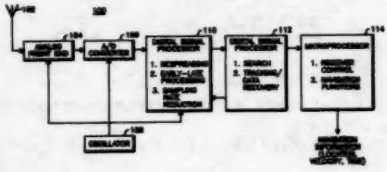
METHOD OF DOPPLER SEARCHING IN A DIGITAL GPS RECEIVER

Steven C. Jasper, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 3, 1985, Ser. No. 771,754

Int. Cl.[4] H04K *1/00*

U.S. Cl. 375—1 **10 Claims**



1. In a spread-spectrum receiver, for receiving one or more direct-sequence-coded signals, each of which may be Doppler shifted from its nominal carrier frequency, wherein for each signal a code delay/Doppler frequency search procedure must be carried out prior to activation of delay-tracking and carrier-recovery loops, an improved method of Doppler frequency search for each desired signal, and for each code delay search trial, comprising the steps of:

a. inputting N consecutive digitized samples of a signal equal to a filtered product of a down-converted received signal multiplied by a locally-generated code of the desired signal, the code delay of said locally-generated code being that of the current code delay search trial, said filtering passing, at least, the band of frequencies corresponding to the entire range of possible Doppler-shifted carrier frequency of said down-converted received signal;

b. calculating the N-point discrete Fourier transform of said block of N samples to produce N complex-valued transformed output samples, each corresponding to one of N equally-spaced search frequencies in the band from zero Hertz to fs (or, equivalently, in the band from $-f_s/2$ to $+f_s/2$), f_s being the sampling frequency of the samples input in step a;

c. calculating the square of the magnitude of each of said N complex-valued output samples to produce N power quantities, corresponding to the N said search frequencies; and

d. performing steps a through c M times, summing the M power quantities produced for each of the N said search frequencies, to produce N quantities proportional to the average power of each respective N search frequency, the maximum of said average power quantities exhibiting indicia of the presence and approximate Doppler frequency shift of said desired signal.

4,701,935

ONE FREQUENCY REPEATER FOR A DIGITAL MICROWAVE RADIO SYSTEM WITH CANCELLATION OF TRANSMITTER-TO-RECEIVER INTERFERENCE

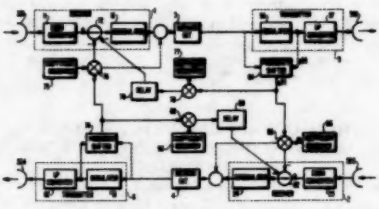
Junji Namiki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 9, 1986, Ser. No. 817,380

Claims priority, application Japan, Jan. 9, 1985, 60-1642; Jan. 9, 1985, 60-1654; Jan. 9, 1985, 60-1655; Mar. 27, 1985, 60-62414; Mar. 27, 1985, 60-62415; Mar. 27, 1985, 60-62416

Int. Cl.[4] H04B 7/15

U.S. Cl. 375—4 37 Claims



1. A one frequency repeater for a digital radio wave transmission system wherein a carrier is modulated by a digital baseband signal and is transmitted as a digital radio wave signal, said repeater comprising:

a first digital signal source for producing a first digital baseband signal;

transmitter circuit means coupled to said first digital signal source for producing a first digital radio wave signal modulated by said first digital baseband signal, said first digital radio wave having a first carrier frequency;

transmitting antenna means for radiating said first radio frequency signal supplied from said transmitter circuit means;

receiving antenna means for receiving a second digital radio wave signal modulated by a second digital baseband signal, said second digital radio wave signal having a second carrier frequency substantially equal to said first carrier frequency, said receiving antenna means receiving said first digital radio wave signal as a transmitter-to-receiver interference signal due to coupling between said first transmitting antenna means and said first receiving antenna means;

receiver circuit means for extracting said second digital baseband signal by demodulating said second radio wave signal received at said receiving antenna, said demodulated second digital baseband signal being accompanied by a baseband interference signal derived from said transmitter-to-receiver interference signal;

means coupled to said first digital signal source for producing an estimated-interference signal corresponding to said baseband interference signal from said first digital baseband signal, said estimated-interference signal producing means comprising transversal filter means comprising a delay line with a predetermined number of tap gains; and

interference cancelling means coupled to said receiver circuit means and said estimated-interference signal producing means for cancelling said baseband interference signal from an output signal of said receiver circuit means using said estimated-interference signal to thereby produce said demodulated second digital baseband signal without said baseband interference signal;

decision circuit means for detecting said second digital baseband signal from an output of said interference cancelling means and regenerating said second digital baseband signal; and

tap gain control means for controlling said tap gains, said tap gain control means comprising first subtracting means for subtracting said regenerated second digital baseband signal from said output signal of said interference cancelling means and providing a first error signal, first multiplier means for multiplying said first digital baseband signal by said first error signal and providing a multiplied signal, and low-pass filter means for smoothing said multiplied signal, said smoothed multiplied signal being supplied to said transversal filter means to control said tap gains so that said first error signal is zero.

4,701,936

APPARATUS AND METHOD FOR ADJUSTING THE RECEIVERS OF DATA TRANSMISSION CHANNELS

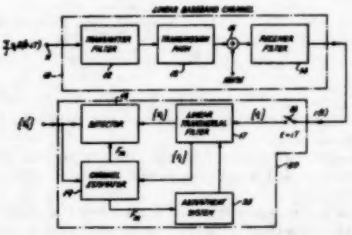
Adrian P. Clark, Loughborough, and Sau F. Hau, London, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 27, 1984, Ser. No. 594,015

Claims priority, application United Kingdom, Mar. 30, 1983, 8308843

Int. Cl.[4] H03H 7/30; H03K 5/159

U.S. Cl. 375—14 27 Claims



1. Apparatus for use in modifying signals received over a data transmission link to make the signals more susceptible of detection, the apparatus being, in operation, coupled to the data transmission link by way of means for generating samples of the output signals of the link at successive times, and the apparatus comprising:

means for providing an estimate of the sampled impulse response of said data transmission link;

a substantially all-pass filter, formed using said estimate, the filter having a sampled impulse-response with a z transform with first roots (zeros), and sets of second roots (zeros), the sets of second roots respectively approximating to poles coinciding with at least most of any roots (zeros) having moduli greater than a predetermined value which is not greater than 1.5 and not less than unity of the z transform of the sampled impulse-response of the predetermined data transmission link, the first roots (zeros) being at values of z which are the complex conjugate reciprocals of those of the said poles and there being one first root for each pole.

4,701,937

SIGNAL STORAGE AND REPLAY SYSTEM

Shyue-Yun Wan; Jeng-Joung Guo, and Cheng-Fung Lin, all of Hsin-Chu, Taiwan, assignors to Industrial Technology Research Institute Republic of China, Hsin-Chu, Taiwan

Filed May 13, 1985, Ser. No. 732,934

Int. Cl.[4] H04B 14/04

U.S. Cl. 375—25 8 Claims

1. A digital communication system for storing and reproducing a fixed pattern nonperiodic sampled signal which is quantized and encoded into data codes and has silent periods represented by a particular data code, comprising

means for generating address codes in a sequence of time steps,

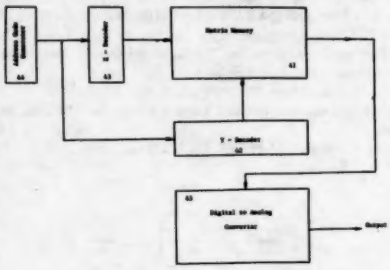
means for storing said data codes in different cells in a mem-

ory except data code for said silent periods without using synchronization and time code as in a real time system,

means for feeding said address codes to one or more X-decoders and Y-decoders,

means for partially decoding said address codes in said decoder to eliminate decoder output during said silent periods,

means for addressing said memory cells from said decoders sequentially corresponding to said address codes except during silent periods,



said decoders having outputs to drive X-select lines and Y-select lines for two-dimensional addressing of a particular said cell,

means for regenerating said data codes of original non-periodic sampled signal when said memory cells are addressed,

means for regenerating said silent period particular data code when there is no decoder output to drive said select lines during said silent periods.

4,701,938

DATA SYSTEM

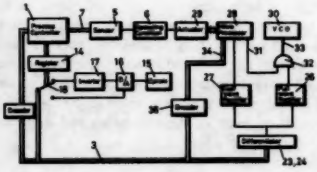
Clifford Bell, Darwen, England, assignor to Keystone International, Inc., Houston, Tex.

Filed Oct. 31, 1985, Ser. No. 794,091

Claims priority, application United Kingdom, Nov. 3, 1984, 8427872; Nov. 19, 1984, 8429204

Int. Cl.[4] H04L *27/00*

U.S. Cl. 375—36 **23 Claims**



1. A data system comprising:

a data transmitting station;

at least one data receiving station; and

a data transmission line coupling said stations together;

said transmitting station comprising processor means providing in multiple state data stream form data for transmission between the stations and encoder means connected to the processor means for encoding the data stream prior to transmission of said data on said transmission line;

each said receiving station comprising decoder means connected to said transmission line for receiving and decoding the encoded data stream, wherein the encoder comprises signal generating means for selectively generating a first waveform substantially corresponding to the integral of a positive pulse having a negative d.c. offset and a second waveform substantially corresponding to the integral of a negative pulse having a positive d.c. offset, the time average of each pulse and its associated d.c. offset being substantially zero, reading means connected to the processor means for sequentially reading each state of the multi-state data stream, and outputting means connected to the signal generating means and controlled by the reading means for outputting onto the data transmission line a composite waveform consisting of a respective combination of the first and second waveforms for each of the states read from the data stream, and wherein each decoder comprises differentiating means for differentiating said composite waveform received from the transmission line to derive a bi-directional pulse train representing the multiple state data stream.

4,701,939

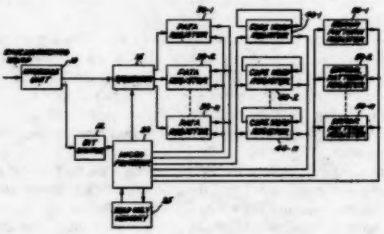
METHOD AND APPARATUS FOR OBTAINING RELIABLE SYNCHRONIZATION OVER A NOISY CHANNEL

Charles A. Stutt, Rexford, and Jagdish T. Gajjar, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 1, 1985, Ser. No. 718,266

Int. Cl.[4] H04L *1/00, 7/04*

U.S. Cl. 375—115 **13 Claims**



11. A method of synchronizing a transmitter and a receiver in a synchronous serial transmission system comprising the steps of:

transmitting with each message block a sync work encoded as a code word of the forward error correction code being employed for the message block;

decoding said sync word at the receiver to provide a decoded sync word; and

comparing said decoded sync word with a known reference to establish synchronization between said transmitter and receiver.

4,701,940

LINEARLY POLARIZED X-RAY PATTERNING PROCESS

Yasunari Soda, Kokubunji; Kozo Mochiji, Hachioji; Takeshi Kimura, Higashimurayama, all of Japan, and Hidehito Obayashyi, Burlingame, Calif., assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,116

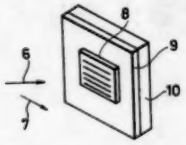
Claims priority, application Japan, Oct. 22, 1984, 59-220557

Int. Cl.[4] G21K *5/00*

U.S. Cl. 378—34 **5 Claims**

1. A process of X-ray lithography, comprising the steps of providing a linearly polarized X-ray, and irradiating a resist on a substrate through a mask with the linearly polarized X-ray to form a pattern shape with high accuracy, the step of irradiating

including controlling the direction of irradiation of the linearly polarized X-ray so that the direction of an electric vector of



the linearly polarized X-ray perpendicularly intersects a direction in which a high accuracy of the pattern shape is required.

4,701,941

RADIATION SOURCE

Stephen G. Szirmai, Northbridge; Gerard R. Newman, Gordon, and Philip L. Kelly, North Manly, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization (CSIRO) and Unisearch Limited, both of, Australia

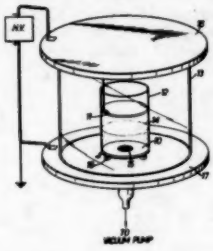
PCT No. PCT/AU84/00020, § 371 Date Oct. 1, 1984, § 102(e) Date Oct. 1, 1984, PCT Pub. No. WO84/03175, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 7, 1984, Ser. No. 666,083

Claims priority, application Australia, Feb. 8, 1983, PF7934

Int. Cl.[4] H01J *35/16*

U.S. Cl. 378—122 **25 Claims**



1. A method of generating X-radiation from an apparatus comprised of:

(a) at least two electrodes mounted in an evacuable chamber with one of the electrodes positioned above the other electrode;

(b) a quantity of a powder of at least one conducting or semi-conducting material supported on the lower of said electrodes when said electrodes have a potential difference that is less than a value of the potential difference which produces a minimum dispersing field for said powder; and

(c) means permitting a transmission of radiation from a region between the electrodes to outside of said chamber; said method comprising the steps of:

(i) evacuating said chamber to a pressure of 10^{-5} Torr or lower, and

(ii) applying to said electrodes a potential difference which has a value in excess of the value which produces the minimum dispersing field for the powder; thus dispersing at least some of said powder between said electrodes and generating X-radiation within said chamber, said X-radiation being transmitted through said means permitting the transmission of radiation.

4,701,942

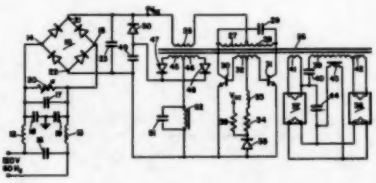
INK JET FLUID FOR RADIOLOGY

Robert J. Ott, Gurnee, Ill., assignor to American Technologies, Inc., Allendale, N.J.

Filed Jun. 10, 1985, Ser. No. 743,146

Int. Cl.[4] G21K *3/00*

U.S. Cl. 378—156 **20 Claims**



1. The method, in radiology, of using a printer to prepare an individual X-ray attenuation compensation mask for each patient by placing ink on a substrate, comprising the steps of:

determining the desired X-ray attenuation of each area of the mask by operating an X-ray source to produce a first X-ray exposure of the patient,

analyzing the X-ray intensity at each location of the receiving field to provide intensity information,

using computer means to convert the intensity information into digital data corresponding thereto, and using the digital data to control a printer to print ink on a substrate with the location of the ink being determined by the said digital data to provide an X-ray attenuation mask which is selectly printed with the ink in certain areas,

positioning the X-ray attenuation mask between the X-ray source and receiving field to attenuate the X-rays by the mask and produce an even intensity of the X-rays at the receiving field and taking a second X-ray exposure of the patient;

characterized in that the printer is an ink jet printer which deposits ink jet droplets on said substrate, the jet printer deposits a plurality of droplets on certain areas of the substrate with the number of droplets at each area being controlled by said digital data, said substrate is an ink absorbent sheet and said ink jet droplets consist of a dispersant of a finely powered metal in a liquid carrier.

4,701,943

PAGING SYSTEM USING LPC SPEECH ENCODING WITH AN ADAPTIVE BIT RATE

Walter L. Davis, Coral Springs, Fla., and Dakshesh D. Parikh, San Jose, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 815,474, Dec. 31, 1985, abandoned. This application Nov. 12, 1986, Ser. No. 930,072

Int. Cl.[4] H04M *11/00*

U.S. Cl. 379—57 **2 Claims**

1. An improved paging system for use with LPC encoded signals, said system comprising:

(a) telephone interface means for inputting paging requests and analog voice information;

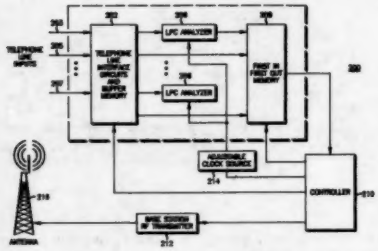
(b) loading measurement means coupled to said telephone interface means for determining the relative loading of said paging system at any particular time and producing an output signal related to said system loading;

(c) terminal means having storage capability, said terminal means coupled to said telephone interface means and generating paging signalling information based on signals taken form said telephone interface means, and further storing and reproducing voice information received from said telephone interface means;

(d) variable clock means, coupled to said load measurement means for producing a clock signal wherein the clock rate is based on said output signal of said loading means and

lower clock rates are produced at times of relatively higher system loading;

(e) LPC analyser means having a clock input, said analyzer means coupled to said terminal means for converting said voice information to digitally encoded LPC signals at a data rate determined by said clock input;



(f) controller means coupled to said terminal means, said analyzer means and said loading measurement means for formatting said LPC encoded voice information, and said paging signaling information in a predefined sequence which includes a digital word indicating the data rate of said predefined sequence; and

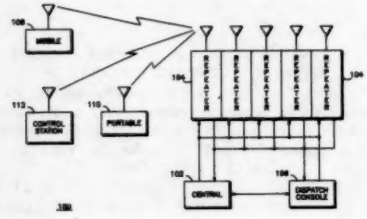
(g) modulator and transmitter means for transmitting said predefined sequence.

4,701,944

SIGNALLING SYSTEM FOR TRUNKED PRIVATE CALLS

Scott P. Howard, Buffalo Grove; Ted A. Kozlowski, Chicago, and Michael H. Retzer, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 17, 1986, Ser. No. 908,472
Int. Cl.[4] H04Q *7/01*
U.S. Cl. 379—63 **20 Claims**



1. In a trunked communication system having a plurality of subscriber units and at least one central station, a method for any one subscriber to request a private call, comprising the steps of:

(a) entering an ID number corresponding to another subscriber unit;

(b) parsing said ID number to a predetermined number of digits;

(c) converting said parsed ID number to a binary number;

(d) parsing said binary number to predetermined number of bits;

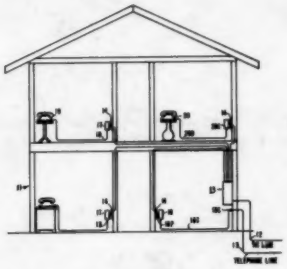
(e) transmitting at least said parsed binary number to the central station.

4,701,945

CARRIER CURRENT TRANSCEIVER

Michael K. Pedigo, 158 South Walnut St., Southport, Ind. 46227

Filed Oct. 9, 1984, Ser. No. 658,886
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—66 **28 Claims**



1. A method of information transmission on transmission line means and comprising the steps of:

encoding an information signal upon a subcarrier signal by means of frequency modulation of that subcarrier, and

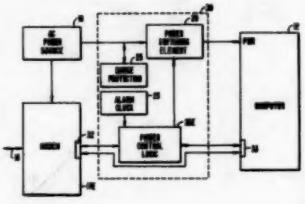
encoding the subcarrier signal upon a carrier signal by frequency modulation of the carrier.

4,701,946

DEVICE FOR CONTROLLING THE APPLICATION OF POWER TO A COMPUTER

Raymond A. Oliva, 3109 Camdon Ct., Pleasanton, Calif. 94566, and Joseph S. Metz, 5906 Cinnabar Ct., Newark, Calif. 94560

Filed Oct. 23, 1984, Ser. No. 663,800
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—98 **15 Claims**



1. Apparatus for use with a modem and a computer for controlling the application of power to the computer, the computer having a power input adapted to receive power from an electrical power source, the apparatus comprising:

power switching means, adapted to be interposed between the power source and the power input, for controlling the flow of power from the power source to the power input, said power switching means being responsive to a control signal, the assertion of which permits power to flow and the withdrawal of which prevents power from flowing; and

logic means, coupled to said power switching means and adapted to be interposed between the computer and the modem, for controlling said power switching means, said logic means being responsive to a data terminal ready signal (DTR) from the computer and a received line signal detect signal (RLSD) from the modem, said logic means operating as follows:

(a) if RLSD is "true," to assert said control signal,

(b) if DTR is "true," to assert said control signal and

communicate said "true" value of DTR to the modem, and to communicate thereafter the actual value of DTR to the modem when DTR changes value from "true" to "false," at least until the modem transmits a "false" RLSD to the logic means and

(c) if RLSD and DTR are both "false," to withdraw said control signal and to communicate a "true" value for DTR to the modem to keep the modem in an active state.

15. Apparatus for use with a computer and an associated modem for controlling the application of power to the computer, the computer having a power input adapted to receive power from an electrical power source, the modem being adapted to be coupled to a communication medium such as a phone line, said modem having a power input and receiving power independently of the computer, and operating to remain in a powered state regardless of whether the computer is powered or unpowered, the apparatus comprising:

power switching means, adapted to be interposed between the power source and the power input of the computer, for controlling the flow of power from the power source to the power input of the computer, said power switching means being responsive to a control signal, the assertion of which permits power to flow and the withdrawal of which prevents power from flowing;

logic means, coupled to said power switching means, for controlling said power switching means, said logic means being responsive to signals communicated between the modem and the computer, including signals representative of an incoming call to the associated modem, said logic means operating as follows:

(a) in response to an incoming call, to assert said control signal,

(b) in response to a call in progress, to assert said control signal, and

(c) in response to signals indicating neither an incoming call nor a call in progress, to withdraw said control signal;

said logic means further comprising power hold-up means responsive to signals indicating a call in progress, for maintaining the assertion of said control signal for a predetermined time interval after the call is terminated;

alarm clock means, coupled to said power switching means, for asserting said control signal at a desired time; and

means, coupled to said logic means and said alarm clock means, for providing a signal to the computer signifying that said logic means or said alarm clock means has caused the assertion of said control signal.

4,701,947

CIRCUIT ARRANGEMENT FOR SUPPRESSING INTERFERENCE SIGNALS ON THE RECEIVING ARM OF A TELEPHONE SUBSCRIBER LINE CIRCUIT

Harald Stader, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

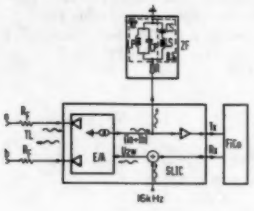
Filed Jun. 11, 1986, Ser. No. 873,010

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1985, 3526529

Int. Cl.[4] H04Q *11/04, 3/24*

U.S. Cl. 379—124 **2 Claims**

1. A circuit arrangement for suppressing interference signals on the receiving arm of a subscriber line circuit, constructed from electronic components and thus without the use of speech transformers, the subscriber line circuit for connecting a two-wire subscriber line to the exchange of a digital time division multiplex telephone system, which interference signals occur as a result of charge pulse signals which are fed-in to the transmitting arm and which are intended for the subscriber station connected to the subscriber line circuit via the two-wire subscriber line, characterized in that the receiving arm of the subscriber line circuit (SLIC) is connected to a two-pole filter circuit (ZF) which consists of the parallel arrangement of a series resonance circuit (LS,CS) and a parallel resonance circuit (LP,CP) whose resonance frequency in each case corresponds to a frequency fed-in for the transmission of the charge pulse signals.



4,701,948

COMMUNICATION SYSTEM HAVING SEPARATE UNIDIRECTIONAL INFORMATION SIGNALLING

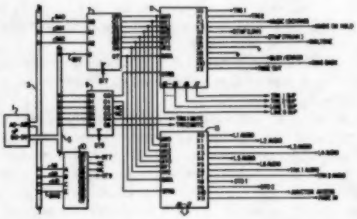
Gerald Molnar, Ottawa, Canada, assignor to Trillium Telephone Systems Inc., Kanata, Canada

Filed Mar. 14, 1986, Ser. No. 839,521

Claims priority, application Canada, Nov. 7, 1985, 494861

Int. Cl.[4] H04M *3/42;* **H04Q** *3/10*

U.S. Cl. 379—165 **29 Claims**



1. A communication system for connection to one or more signal ports, comprising:

(a) central control means for generating control signals,

(b) one or more information signal source circuits,

(c) one or more interface circuits for connection to said signal ports, including unidirectional transmit and receive signal paths,

(d) a first switching matrix connected to said central control means for receiving predetermined ones of said control signals and in response interconnecting predetermined ones of said interface circuits for establishing one or more bidirectional communication paths between predetermined ones of said signal ports via said transmit and receive signal paths, and

(e) a second switching matrix connected to said central control means, for receiving further predetermined ones of said control signals and connecting a predetermined one or more of said information signal source circuits to the transmit signal paths of one or more of said interface circuits, for establishing one or more unidirectional communication paths between predetermined ones of said information signal source circuits and signal ports via said transmit signal paths,

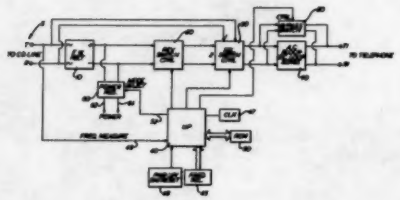
whereby information signals are transmitted to said signal ports via said second switching matrix independently of signal traffic in said first switching matrix.

4,701,949

FREQUENCY RESPONSIVE PARTY TELEPHONE LINE SELECTION APPARATUS AND METHOD

Daniel Lynch, Jackson, and Steven B. Perry, Highlands, both of N.J., assignors to Keptel, Inc., Tinton Falls, N.J.

Filed Aug. 9, 1985, Ser. No. 764,225
Int. Cl.[4] H04M *13/00*
U.S. Cl. 379—179 19 Claims



1. Apparatus adapted to be coupled into a party telephone line for selecting a ringing signal transmitted on the line from among a plurality of possible coded ringing signals that could be transmitted on the line and for coupling the ringing signal to a telephone comprising:

first means coupled to the party line for converting a ringing signal on the line into a rectified signal;

second means having said rectified signal as an input for reversing the polarity of said rectified signal at selected times in dependence on a first control signal;

third means coupled to said second means and to said party line for selecting said ringing signal on said party line or said rectified signal from said second means in dependence on a second control signal;

fourth means coupled to said third means for coupling said selected signal to a telephone in dependence on a third control signal; and

control means for determining the frequency of said ringing signal, said control means comprising means for generating said third control signal if said ringing signal is of the proper frequency associated with the receiving party from among a plurality of frequencies, means for generating said second control signal to thereby allow said third means to select said rectified signal if said ringing signal is not within a selected frequency range and said ringing signal if said ringing signal is within said selected frequency range, and means for generating said first control signal to reverse the polarity of said rectified signal at selected times if said ringing signal is not within said selected frequency range.

4,701,950

TELEPHONE ANSWERING SYSTEM WITH LINE DETECTOR

William J. Curtin; Stephen Soto, both of Madison, and Steven Krueger, Windsor, all of Wis., assignors to Amtel Communications, Inc., Madison, Wis.

Filed Apr. 12, 1984, Ser. No. 599,715
Int. Cl.[4] H04M *3/22, 3/50*
U.S. Cl. 379—214 14 Claims

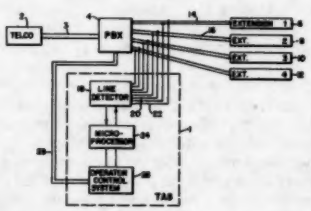
1. A telephone answering system for use in conjunction with a PBX/CENTREX system, said telephone answering system comprising:

an operator control means;

a line detection system for monitoring the telephone lines within the PBX/CENTREX system, said detection system including:

a plurality of ring/hook interface means, each being connected in parallel across one of the telephone lines in the PBX/CENTREX system being monitored, each said interface means including ring detection means for detecting a ring signal on the associated telephone line for providing a ring count when there is an incoming call and hook detection means for detecting the on/off hook condition on the associated telephone line; and

coupling means for coupling said ring detection means and said hook detection means to said operator control means for providing information to said operator control means indicative of the ring counts and hook conditions of the telephone lines being monitored;



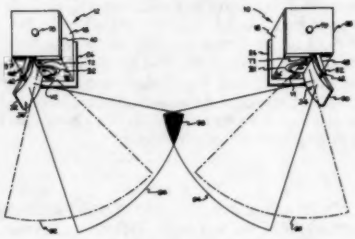
said operator control means being coupled to said detection system and including means for causing the PBX/CENTREX system to carry out a directed call pick-up when the ring count on a monitored telephone line has exceeded a preselected limit without the incoming call being answered and for transferring such incoming call to said operator control means for answering by an operator.

4,701,951

ACOUSTIC IMAGER

Albert Kash, 8307 Lages La., Baltimore, Md. 21207

Filed Mar. 17, 1986, Ser. No. 840,153
Int. Cl.[4] H04R *5/00, 1/02*
U.S. Cl. 381—24 23 Claims



1. A stereophonic sound system, comprising:

a pair of enclosures positionable in a spaced apart configuration;

each of said enclosures including a pair of electro-acoustic transducers operable over overlapping frequency ranges, arranged in vertical symmetry about a common vertical plane;

individual panel means associated with each of said enclosures, for each providing a reflecting surface having a substantially vertical axis; and

separate means connectable to different ones of said enclosures for individually positioning each of said panel means with said axis disposed parallel to said common plane at variable distances from and at variable angular orientations to said common plane and with said panel being free to rotate through three hundred and sixty degrees about said vertical axis, whereby each of said panel means is individually positionable with an orientation of said reflective surface relative to the corresponding pair of said

transducers to simultaneously redirect energy emanating from both transducers forming each corresponding pair.

4,701,952

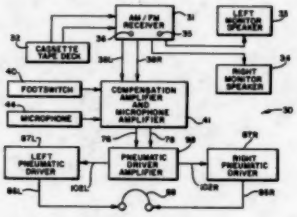
FREQUENCY ATTENUATION COMPENSATED PNEUMATIC HEADPHONE AND LIQUID TUBE AUDIO SYSTEM FOR MEDICAL USE

Jefferson H. Taylor, 9430 Covemeadow Dr., Dallas, Tex. 75238

Continuation-in-part of Ser. No. 659,413, Oct. 10, 1984, abandoned. This application Oct. 27, 1986, Ser. No. 923,668

Int. Cl.[4] H04R 5/00

U.S. Cl. 381—25 **19 Claims**



1. A frequency attenuation compensated pneumatic headphone and acoustic tube audio system comprising: pneumatic tube driver means; acoustic plastic tube means transparent to scanning fields such as a Nuclear Magnetic Resonance field and in a length range of approximately ten to fifty feet; plastic material pneumatic headphones for a user that are transparent to scanning signals so as to not cause interference with scanning signals; pneumatic tube driver means for driving audio signals through said acoustic plastic tube means and said pneumatic headphones to the ears of a user; program signal source means; a frequency response compensation amplifier connected to the output of said program signal source means that with progressively higher frequencies boosts the higher frequencies to compensate for the increasing attenuation of progressively higher frequencies as audio is passed through said acoustic tube means; circuit means interconnecting said compensation amplifier and said pneumatic tube driver means; including pneumatic driver amplifier means interconnecting said compensation amplifier and said pneumatic tube driver means; wherein said program signal source means is a stereo signal source; said compensation amplifier is a stereo signal two channel amplifier; monitor speaker means is connected directly to said program signal source means; said pneumatic driver amplifier means includes a stero control amplifier and left and right pneumatic driver amplifiers; and wherein said compensation amplifier includes settable resistance valve means for adjusting higher frequency boost compensation for different length acoustic plastic tube means of substantially matched pair lengths used in different installations.

4,701,953

SIGNAL COMPRESSION SYSTEM

Mark W. White, Oakland, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jul. 24, 1984, Ser. No. 633,943

Int. Cl.[4] G10L 5/00

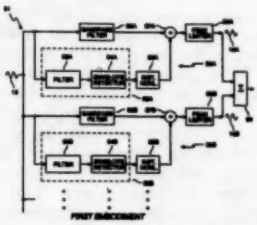
U.S. Cl. 381—46 **13 Claims**

1. A signal compression system for compressing a broadband signal, comprising: a plurality of channel filters each including:

bandpass filter means for filtering out all but a first spectral portion of said broadband signal;

integration filter means for filtering out all but a second spectral portion of said broadband signal, said second spectral portion being significantly broader than said first spectral portion of said broadband signal; and

envelope detector means for deriving an estimate of the intensity of the signal passed by said integration filter means, said envelope detector means having an integration window corresponding to the low frequency end of the non-envelope components of the signal passed by said integration filter means; and



means for compressing the signal passed by said bandpass filter means using a variable gain having a preselected functional relationship to said derived intensity estimate.

4,701,954

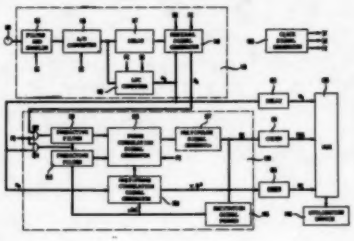
MULTIPULSE LPC SPEECH PROCESSING ARRANGEMENT

Bishnu S. Atal, New Providence, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 16, 1984, Ser. No. 590,228

Int. Cl.[4] G10L 5/00

U.S. Cl. 381—49 **6 Claims**



1. A method for generating multipulse excitation codes for a speech pattern comprising the steps of:

partitioning a speech pattern into successive time frame portions;

generating a set of predictive parameter signals representative of the speech pattern portion of each successive time frame;

producing a signal representative of the predictive residual of each successive time frame speech pattern portion responsive to the time frame speech parameter signals and time frame speech pattern portion; and

generating a multipulse excitation code having a sequence of $n=1, 2, \ldots, N$ pulses for each successive time frame to provide prescribed coded speech pattern quality where N is substantially independent of the pitch of the speech pattern by iteratively forming pulses for said time frame, each pulse having a magnitude β and a location m within the frame in N successive iterations and each successive iteration including the steps of;

combining said time frame predictive parameter signals with said time frame predictive residual signals to form a signal

y(n) corresponding to the time frame speech pattern portion,

combining the excitation pulse sequence of the preceding iteration with said time frame predictive parameter signals to form a signal z(n) corresponding to the contribution of the preceding iteration excitation pulse sequence to the time frame speech pattern portion,

forming a signal representative of the differences between said signal y(n) corresponding to the time frame speech pattern portion and said signal z(n) corresponding to the contribution of the preceding iteration excitation pulse sequence to the time frame speech pattern portion,

comparing the current time frame signal representative of the differences between the signal y(n) corresponding to the time frame speech pattern portion and said signal z(n) corresponding to the contribution of the preceding iteration excitation pulse sequence to the time frame speech pattern portion with the signal of prescribed preceding time frames representative of the differences between said signal y(n) corresponding to the preceding time frame speech pattern portion and said signal z(n) corresponding to the contribution of the preceding iteration excitation pulse sequence to the preceding time frame speech pattern portion to generate a signal $y_p(n)$ representative of speech pattern portions of said preceding time frames having a predetermined degree of similarity to the speech pattern portion of the time frame, and

producing an excitation pulse of magnitude β and location m for the present iteration responsive to the differences between said speech pattern portion representative signal y(n) and the sum of said signal representative of the contribution of the preceding iteration excitation pulse sequence to the time frame speech pattern portion and said signal $y_p(n)$ representative of similar speech pattern portions of said preceding time frames.

4,701,955

VARIABLE FRAME LENGTH VOCODER

Tetsu Taguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

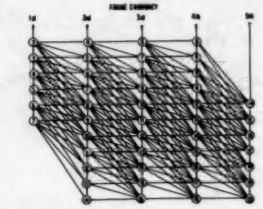
Filed Oct. 21, 1983, Ser. No. 544,198

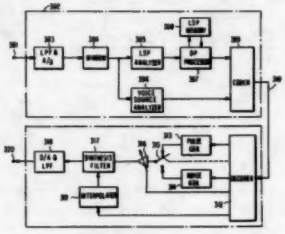
Claims priority, application Japan, Oct. 21, 1982, 57-185196; Jul. 19, 1983, 58-131439

Int. Cl.⁴ G10L *1/00*

U.S. Cl. 381—51 **11 Claims**

1. A variable frame length vocoder comprising: means for obtaining a feature vector from an output speech signal at every given frame; means for storing the feature vectors in a given section having a predetermined number of frames; means for approximating a change in said feature vectors in said given section with a given number of flat sections indicating the period of time with little or no change in the feature vectors, and inclined sections connecting said neighboring flat sections with inclined lines and indicating period of time with abrupt transitions in the feature vectors, said flat section length being variable, said inclined section length being constant, said inclined line representing the change of the feature vectors; means for outputting the feature vector of a given frame in each flat section as a representative vector of said flat section; means for outputting the number of frames present in said flat section as a repeat signal; and, on a synthesis side, means for producing the feature vector in each of said inclined sections





by interpolating between the representative vectors of the flat sections present on both sides of said inclined section.

4,701,956

TONE SIGNAL PROCESSING DEVICE

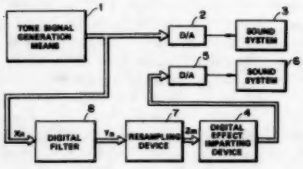
Mitsumi Katoh, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 4, 1985, Ser. No. 784,860

Claims priority, application Japan, Oct. 11, 1984, 59-211515

Int. Cl.⁴ H03G *3/00*

U.S. Cl. 381—61 **9 Claims**



1. An improved electronic musical instrument comprising:

clock means for providing a relatively high frequency clock signal having an associated clock period;

tone signal generation means for providing a first digital tone signal having a first sampling frequency four times as high as said clock frequency, corresponding to 64 sample points per cycle of the digital tone signal, and having an associated first sampling period;

a digital filter for receiving said first digital tone signal and filtering out substantially all frequencies above a predetermined cutoff frequency, said digital filter comprising:

first, second and third delay circuits, coupled in series and providing first, second and third delayed digital tone signals, respectively, said first delay circuit receiving said first digital tone signal, each delay circuit having 16 stages each stage delaying said digital tone signal by one

first sampling period, each said delay circuit thereby delaying said digital tone signal by 16 first sampling periods;

a selector circuit coupled to said tone signal means, said first, second and third delay circuits and said clock means for selecting at every clock pulse one of said first digital digital tone signal and said first, second and third delayed digital tone signals and providing such selected signal as a selector output signal;

filter coefficient means for providing a predetermined filter coefficient signal every clock period; and

a multiplier circuit for receiving said selector output signal and said filter coefficient signal and multiplying said two signals every clock period and providing said multiplied signals as a multiplier output signal;

an accumulator circuit for receiving said multiplier output signal and accumulating said multiplier output signal over 64 clock periods and providing an accumulated multiplier output signal every 64 periods; and

sampling means for receiving said accumulated signal and resampling said signals every 16 first sampling periods.

4,701,957

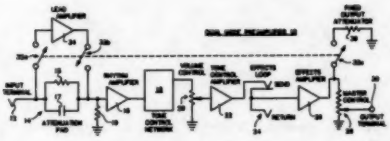
DUAL MODE MUSIC INSTRUMENT PREAMPLIFIER

Randall C. Smith, 1317 Ross St., Petaluma, Calif. 94952

Filed Nov. 26, 1986, Ser. No. 935,270

Int. Cl.[4] H03G *3/00*

U.S. Cl. 381—61 **8 Claims**



1. A preamplifier circuit for enhancing sound generated by a musical instrument such as a guitar and which is converted into electrical signals comprising:

an input for receiving said electrical signals,

a passive high impedance input network connected to said input,

first preamplifier means connected to said passive input network for non-distortion amplification of said electrical signals in a first mode of operation and capable of saturation distortion amplification of said electrical signals upon being overdriven in a second mode of operation,

an output terminal connected to the output of the first preamplifier means and including an output attenuation network,

commonly actuated switch means for switching between said first mode of operation and said second mode of operation,

overdrive amplifier means connectable to bridge across said passive input network in response to said switch means for overdriving said first preamplifier thereby to cause saturation distortion amplification of said electrical signals, and

shunt network means switchably connectable across said output terminal in response to said switch means thereby to equalize output amplitude of said preamplifier circuit between said first and said second modes of operation.

4,701,958

CONTROL CIRCUIT

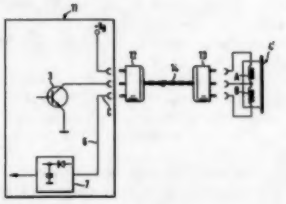
Harald Neth, Elisenstrasse 33, A 1235 Vienna, Austria

Filed May 6, 1985, Ser. No. 730,488

Claims priority, application Austria, May 24, 1984, 1722/84

Int. Cl.[4] H04R *25/00, 25/04*

U.S. Cl. 381—68 **5 Claims**



1. An automatic gain control circuit for an output signal of a magnetic earpiece of a hearing aid, which comprises

(a) a voltage source,

(b) an output amplifier stage having an input connected to the voltage source and an output connected to the magnetic earpiece,

(1) the earpiece having a working winding connected between the amplifier stage output and the voltage source, and

(c) a control loop for automatic gain control, the control loop including

(1) a rectifier and

(2) an additional winding connected in series with the working winding of the earpiece, the windings constituting an autotransformer, the additional winding connecting the rectifier to the output of the amplifier stage and the rectifier being connected to the input of the amplifier stage.

4,701,959

FINGERPRINT INPUT DEVICE EQUIPPED WITH A CLEANER FOR FINGER-IMPRESSING SURFACE

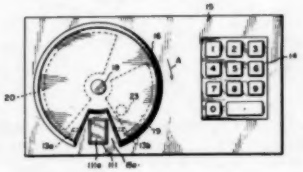
Ko Asai, and Koichiro Morita, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 18, 1985, Ser. No. 756,447

Claims priority, application Japan, Jul. 18, 1984, 59-148888; Jul. 18, 1984, 59-148892

Int. Cl.[4] G06K *9/00, 9/26*

U.S. Cl. 382—1 **9 Claims**



9. A fingerprint input device for reading an image of a fingerprint from a surface of a finger comprising:

a base plate including a transparent portion having a finger-impressing surface with a length on which said finger is to be impressed;

scanning means for optically scanning said finger-impressing surface to read the fingerprint of said finger;

rotary means rotatably provided on a surface of said base plate, said rotary means being rotatable around an axis substantially perpendicular to said finger-impressing surface and having a first portion with a length more than the

length of said finger-impressing surface and a second portion provided with a window large enough to expose said finger-impressing surface;

a first and second cleaning members provided on a bottom surface of said first portion of said rotary means, said first and second cleaning member wipes being separated from each other in a direction of a rotation of said rotary means so that said first cleaning member wipes said finger-impressing surface, and then said second cleaning member wipes said finger-impressing surface;

means for supplying cleaning liquid to said first cleaning member;

code inputting means for inputting an identification code for accessing a minutiae list of one of registered fingerprints stored in a memory means, said code inputting means operated when said fingerprint input device is to be utilized;

sensor means provided on said second portion of said rotary means whereby the presence or absence of said finger on said finger-impressing surface is detected by said sensor means when said second portion of said rotary means is located on said finger-impressing surface; and

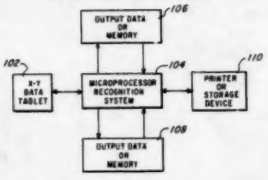
control means for controlling said scanning means and said rotary means in response to outputs of said code inputting means and said sensor means, said control means enabling said rotary means to rotate to a first position wherein said second portion of said rotary means is located on said finger-impressing surface to expose the same when the input of said indentification code is completed, and next enabling said scanning means to read said fingerprint when said sensor means detects the presence of said finger on said finger-impressing surface, and then enabling said rotary means to rotate to a second position wherein said first portion of said rotary means is located on said finger-impressing surface to cover the same when said sensor means detect the absence of said finger on said finger-impressing surface.

4,701,960

SIGNATURE VERIFICATION

Warner C. Scott, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 546,786, Oct. 28, 1983, abandoned.
This application Feb. 20, 1986, Ser. No. 833,508
Int. Cl.[4] G06K 9/46
U.S. Cl. 382—3 **8 Claims**



1. The method of signature vertification comprising:

(a) inputting a first reference location of a writing instrument while writing a sample signature,

(b) inputting a second reference location of the writing instrument while writing a sample signature,

(c) generating a number string representative of a relationship between the first reference location and the second reference location;

(d) repeating steps b-c using the second reference location as the first reference location thereby generating a series of number strings representative of the sample signature,

(e) determining the derivative of each of the series of number strings,

(f) selecting those number strings as buoys whose respective derivatives are greater than a buoy threshold value,

(g) lowering the buoy threshold value if the number of buoys in the sample signature is less than a predetermined minimum value and selecting those number strings as buoys whose respective derivatives are the greater than the lower buoy threshold value,

(h) raising the buoy threshold value if the number of buoys in the sample signature is greater than a predetermined maximum value and selecting those number strings as buoys whose respective derivatives are greater than the raised buoy threshold,

(i) aligning the buoy of the sample signature with buoys of a reference signature,

(j) comparing the sample signature series of number strings to a series of number strings representative of the reference signature; and,

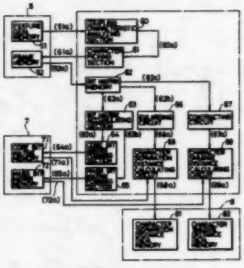
(k) providing an output indicating if the same individual wrote the sample signature and reference signature.

4,701,961

CHARACTER IDENTIFYING APPARATUS

Yasuo Hongo, Kanagawa, Japan, assignor to Fuji Electric Company, Ltd., Kanagawa, Japan

Filed Apr. 26, 1985, Ser. No. 727,889
Claims priority, application Japan, Apr. 27, 1984, 59-84080
Int. Cl.[4] G06K 9/62
U.S. Cl. 382—34 **2 Claims**



1. A character identifying device for identifying an unknown character pattern by processing input video signals generated by scanning the unknown character pattern and reference video signals generated by scanning reference character patterns, the device comprising:

binary coding means for generating reference and input binary coded signals corresponding respectively to the reference and input video signals;

feature data extracting means for dividing said reference binary coded signals into segments and for extracting feature data from said segments, wherein said segments of each of said reference binary coded signals correspond to different portions of the corresponding reference character patterns, and wherein the feature data extracted from each of said segments includes coupling features identifying the corresponding one of said reference character patterns;

coupling characteristic analyzing means for analyzing said coupling features of said segments by processing said feature data;

bit matrix forming means for generating at least one bit matrix for each of the reference character patterns by combining selected ones of said segments in accordance with the coupling features thereof, each of said bit matrices comprising a plurality of matrix elements having a first value if said matrix element corresponds to a portion of that reference character pattern or a second value if said matrix element does not correspond to a portion of that reference character pattern;

accumulation matrix forming means for generating for each of said reference character patterns an accumulation matrix having substantially the same size as the at least one bit matrix for the corresponding reference character pattern, each of said accumulation matrices including a plurality of accumulation matrix elements each corresponding to a different one of the elements in the at least one bit matrix for the corresponding reference character pattern and each of said accumulation matrix elements having values substantially equal to the number of corresponding elements of the at least one bit matrix for the same reference character patterns which have said first value;

means for forming, for each of said accumulation matrices, a core bit matrix and an associated mask bit matrix each said core bit and mask bit matrix including a plurality of core bit elements and mask bit elements, respectively, each associated with a corresponding accumulation matrix element wherein each of said core bit elements has said first value and each of said associated mask bit elements has said second value if the value of the corresponding accumulation matrix element is greater than a first accumulation value and a second accumulation value, respectively, and bears a predetermined relationship to other core bit elements and mask bit elements, respectively;

operating means for generating an enlarged bit matrix and a contracted bit matrix from said input binary coded signals, said enlarged bit matrix including a plurality of bit matrix elements representing an enlargement of said unknown character pattern and said contracted bit matrix including a plurality of bit matrix elements representing a contraction of said unknown character pattern; and

first calculating means for comparing the elements of said enlarged bit matrix and said core bit matrices for said reference patterns to obtain character separation distances; and

second calculating means for comparing the elements of said contracted bit matrix and said mask bit matrices for said reference patterns to obtain character smudge distances;

whereby said character separation distances and said character smudge distances can be used to identify said known character pattern as one of said reference character patterns.

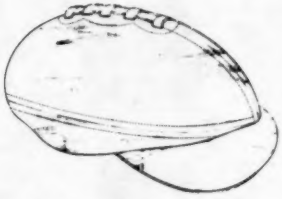
DESIGNS

OCTOBER 20, 1987

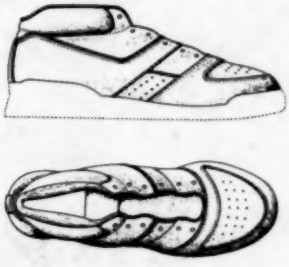
292,340
PROTECTIVE TROUSERS
Fredrik Sjöholm, Kalmar, Sweden, assignor to Tano Aktiebolag, Norrkoping, Sweden
Filed May 22, 1985, Ser. No. 736,706
Claims priority, application Sweden, Nov. 23, 1984, 843128
Term of patent 14 years
U.S. Cl. D2—28

292,341
JACKET
A. Shepherd Jones, III, Irish Bend Rd. A.S.J., P.O. Box 321, Franklin, La. 70538
Filed Sep. 24, 1984, Ser. No. 653,286
Term of patent 14 years
U.S. Cl. D2—187

292,342
FOOTBALL CAP
Ed Schlegel, 2100 W. 100th Ave., Space No. 226, Denver, Colo. 80221
Filed Apr. 11, 1985, Ser. No. 722,286
Term of patent 14 years
U.S. Cl. D2—248

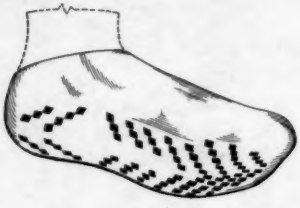


292,343
SHOE UPPER
Bruce W. MacGregor, Lake Oswego, and Brenda C. Kelley, Beaverton, both of Oreg., assignors to Penna, Inc., Portland, Oreg.
Filed Apr. 4, 1986, Ser. No. 847,883
Term of patent 14 years
U.S. Cl. D2—314



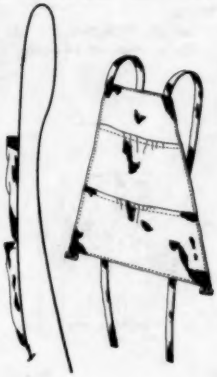
292,344
SHOE SOLE
Arnold S. Austin, East Brookfield, Mass., assignor to Quabaug Rubber Company, North Brookfield, Mass.
Filed Jun. 17, 1985, Ser. No. 745,437
Term of patent 14 years
U.S. Cl. D2—320

292,345
SOCK
Robert L. Hubbard, Henderson, N.C., assignor to Americal Corporation, Henderson, N.C.
Filed Jul. 6, 1984, Ser. No. 628,905
Term of patent 14 years
U.S. Cl. D2—329

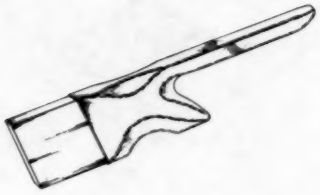


292,346
WALKING STICK OR SIMILAR ARTICLE
Norton Kolomeyer, 5694 Greenridge Rd., Castro Valley, Calif. 94546
Filed Apr. 26, 1984, Ser. No. 603,923
Term of patent 14 years
U.S. Cl. D3—7

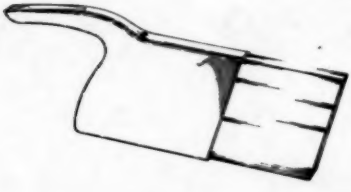
292,347
AUTO KNAPSACK
Joan K. Scott-Smith, 91 Ashuelot St., Dalton, Mass. 01226
Filed Jun. 11, 1984, Ser. No. 619,628
Term of patent 14 years
U.S. Cl. D3—40



292,348
PAINT BRUSH
Wink Roberts, 22844½ Pacific Coast Hwy., Malibu, Calif. 90265; Jay Shields, Santa Monica, and Andrew Pryciak, Pacific Palisades, both of Calif., assignors to Wink Roberts, Malibu, Calif.
Filed Jun. 9, 1986, Ser. No. 872,435
Term of patent 14 years
U.S. Cl. D4—129



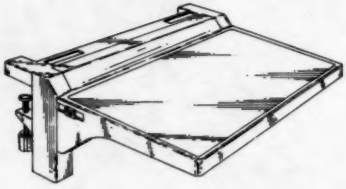
292,349
PAINT BRUSH
Wink Roberts, 22844½ Pacific Coast Hwy., Malibu, Calif. 90265; Jay Shields, Santa Monica, and Andrew Pryciak, Pacific Palisades, both of Calif., assignors to Wink Roberts, Malibu, Calif.
Filed Jun. 9, 1986, Ser. No. 872,467
Term of patent 14 years
U.S. Cl. D4—129



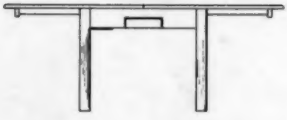
292,350
CHAISE LOUNGE
Paul R. Goldman, 8 Joyce Ter., Andover, Mass. 01810, assignor to Paul R. Goldman, Andover, Mass.
Filed Apr. 17, 1985, Ser. No. 724,071
Term of patent 14 years
U.S. Cl. D6—361

292,351
CHAIR
Ansgar Brossard, and Arno Körner, both of Munich, Fed. Rep. of Germany, assignors to Viasit Bürositzmöbel GmbH, Bad Homburg, Fed. Rep. of Germany
Filed Apr. 17, 1985, Ser. No. 724,182
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3 MR 28
Term of patent 14 years
U.S. Cl. D6—366

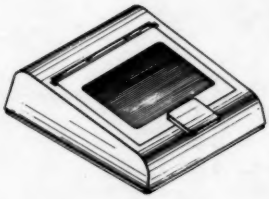
292,352
ADJUSTABLE WORK SURFACE
James F. Hampshire, Stephens City, and Glen E. Tomblin, Winchester, both of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Jan. 25, 1985, Ser. No. 695,139
Term of patent 14 years
U.S. Cl. D6—418

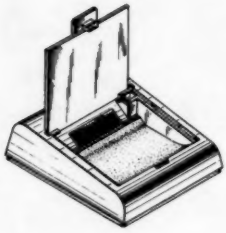


292,353
CONVERTIBLE CARD TABLE OR SIMILAR ARTICLE
Ruca Chien, No. 77, Kuang Rong Lane, Sec. 2, Chung Shan Rd., Taipei Hsien, Taiwan
Filed Jan. 2, 1985, Ser. No. 688,320
Term of patent 14 years
U.S. Cl. D6—430

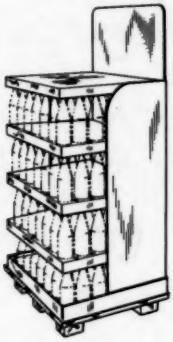


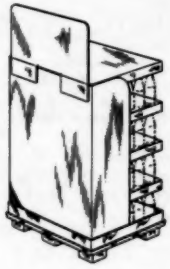
292,354
COIN STORAGE UNIT WITH LIGHT
Samuel M. Seltzer, and Saul Dennison, both of Livingston, N.J., assignors to Allison Corporation, Livingston, N.J.
Filed May 23, 1985, Ser. No. 737,237
Term of patent 14 years
U.S. Cl. D6—440



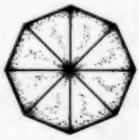


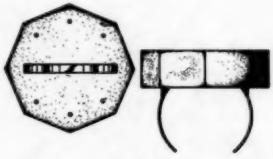
292,355
DISPLAY STAND
Randall G. Headon, Willowdale, Canada, assignor to CDA Industries Inc., Scarborough, Canada
Filed Dec. 13, 1984, Ser. No. 680,999
Claims priority, application Canada, Jun. 14, 1984, 14-06-84-4
Term of patent 14 years
U.S. Cl. D6—479



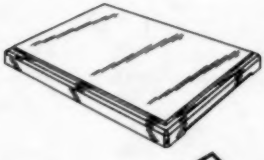


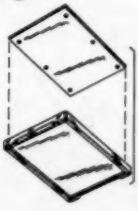
292,356
LOWER BACK PILLOW
Orville D. Veneman, P.O. Box 452, Elko, Nev. 89801
Filed Apr. 1, 1985, Ser. No. 718,105
Term of patent 14 years
U.S. Cl. D6—601



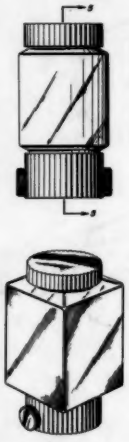


292,357
COMBINATION TRIVET AND SERVING TRAY
Terence Y. Narain, 6477 Sorrel Way, West Linn, Oreg. 97068
Filed Jan. 15, 1985, Ser. No. 691,655
Term of patent 14 years
U.S. Cl. D7—21

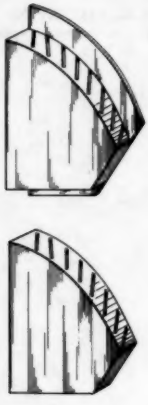




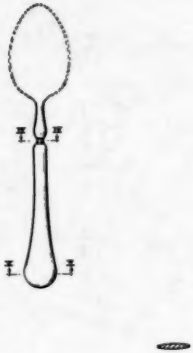
292,358
MEASURING DISPENSER FOR COFFEE AND OTHER GRANULAR SUBSTANCES
William M. Cockrell, 217 Dolphin Way, Apartment P, Laguna Beach, Calif. 92651
Filed Mar. 22, 1985, Ser. No. 715,018
Term of patent 14 years
U.S. Cl. D7—50



292,359
KNIFE RACK
Albert E. Daw, 434 Bruce Avenue, Nanaimo, British Columbia, Canada V9R 3Y4
Filed Dec. 13, 1984, Ser. No. 681,237
Claims priority, application Canada, Nov. 8, 1984, 8-11-84-6
Term of patent 14 years
U.S. Cl. D7—74



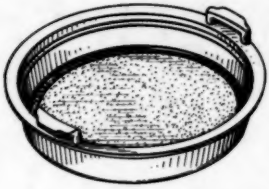
292,360
HANDLE FOR A SPOON OR SIMILAR ARTICLE OF FLATWARE
Henry Bouilhet, Garches, France, assignor to La Société Orfevrerie Christofle, Paris, France
Filed Jan. 14, 1985, Ser. No. 691,097
Claims priority, application Hague, Aug. 3, 1984, DM/004069
Term of patent 14 years
U.S. Cl. D7—152



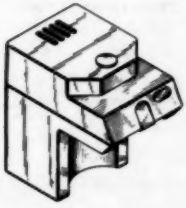
292,361
HANDLE FOR A FORK OR SIMILAR ARTICLE OF FLATWARE
Henry Bouilhet, Garches, France, assignor to La Société Orfevrerie Christofle, Paris, France
Filed Jan. 14, 1985, Ser. No. 691,098
Claims priority, application Hague, Aug. 3, 1984, DM/004069
Term of patent 14 years
U.S. Cl. D7—152

292,362
COOKING UTENSIL OR SIMILAR ARTICLE
Chang H. Oh, Kyung Ki Do, Rep. of Korea, assignor to J & L Importers, Inc., King of Prussia, Pa.
Filed Nov. 5, 1984, Ser. No. 668,338
Claims priority, application Rep. of Korea, Jun. 1, 1984, 6424
Term of patent 14 years
U.S. Cl. D7—360

292,363
FRY PAN OR SIMILAR ARTICLE
Chang H. Oh, Kyung Ki Do, Rep. of Korea, assignor to J & L Importers, Inc., King of Prussia, Pa.
Filed Nov. 5, 1984, Ser. No. 668,340
Claims priority, application Rep. of Korea, Jun. 7, 1984, 6563
Term of patent 14 years
U.S. Cl. D7—360

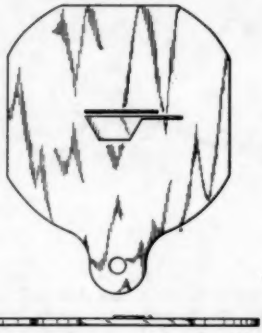


292,364
FOOD PROCESSOR
William L. Bartlett; Edward Cruz, both of Santa Barbara, and David Harding, Ojai, all of Calif., assignors to Rival Manufacturing Company, Kansas City, Mo.
Filed Mar. 22, 1985, Ser. No. 715,093
Term of patent 14 years
U.S. Cl. D7—384

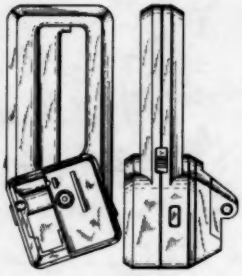


292,365
CLOSURE-PENETRATING SUPPORT FOR A BOTTLE
J. Dave Bozarth, 18162 Romelle Ave., Santa Ana, Calif. 92705
Filed Oct. 9, 1984, Ser. No. 659,060
Term of patent 14 years
U.S. Cl. D7—387

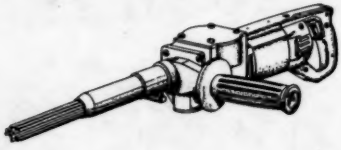
292,366
SPLATTER COVER FOR MICROWAVE OVEN
Barbara Kuether, and Mark Kuether, both of 108 Los Angeles Ave., Sheboygan, Wis. 53081
Filed Oct. 29, 1984, Ser. No. 666,168
Term of patent 14 years
U.S. Cl. D7—391



292,367
HAND-HELD CAN OPENER
Ronald L. Muller, Old Saybrook, and William J. Rakocy, Madison, both of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Mar. 7, 1985, Ser. No. 710,767
Term of patent 14 years
U.S. Cl. D8—41

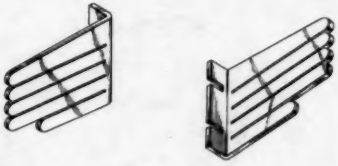


292,368
MULTI-NEEDLE TYPE CHISEL
Toshio Mikiya, 9-17, Todoroki 1-chome, Setagaya-ku, Tokyo, Japan
Filed Jun. 6, 1984, Ser. No. 617,891
Claims priority, application Japan, Dec. 7, 1983, 58-52662
Term of patent 14 years
U.S. Cl. D8—61



292,369
LATCHING DEVICE FOR ROLLING GATES
Vincent Greco, 195 Huntington Ave., Bronx, N.Y. 10465
Division of Ser. No. 495,123, May 16, 1983, Pat. No. Des. 283,672. This application Nov. 1, 1985, Ser. No. 793,957
Term of patent 14 years
U.S. Cl. D8—331

292,370
BRACKET FOR SHAPING CURTAINS AND SIMILAR ARTICLES
Lyman N. Fairbanks, Arlington, Va., assignor to Custom Shade & Awning Corp., Alexandria, Va.
Filed Feb. 15, 1985, Ser. No. 702,301
Term of patent 14 years
U.S. Cl. D8—369



292,371
BOTTLE
William C. Cooper, 21 Picketts Ridge Rd., West Redding, Conn. 06896
Filed Apr. 29, 1985, Ser. No. 728,652
Term of patent 14 years
U.S. Cl. D9—309

292,372
CONTAINER FOR TABLETS OR THE LIKE
Donald J. Sykes, Upper Saddle River, N.J., assignor to Marpac Industries, Inc., Waldwick, N.J.
Filed Apr. 3, 1985, Ser. No. 719,447
Term of patent 14 years
U.S. Cl. D9—339

292,373

DUAL UNIT CONTAINER

Allan Costa, 23 Horseshoe Rd., Old Westbury, N.Y. 11568

Filed Apr. 22, 1985, Ser. No. 725,734

Term of patent 14 years

U.S. Cl. D9—347

292,374

BOTTLE

André Jacobs, Meise; Richard May, Brussels, and Marcel Vanderbroek, Grimbergen, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 1, 1985, Ser. No. 750,833

Claims priority, application Benelux, Jan. 4, 1985, 3490-01; Jan. 4, 1985, 3490-07

Term of patent 14 years

U.S. Cl. D9—349

292,375

BOTTLE

André Jacobs, Meise; Richard May, Brussels; Marcel Vandebroek, Grimbergen, and Frieda Sporen, Houthalen, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 1, 1985, Ser. No. 750,826

Claims priority, application Benelux, Jan. 4, 1985, 3490-04; Jan. 4, 1985, 3490-13; Jan. 4, 1985, 3490-16; Jan. 4, 1985, 3490-17; Jan. 4, 1985, 3490-18

Term of patent 14 years

U.S. Cl. D9—349

292,376

BOTTLE

André Jacobs, Meise; Richard May, Brussels; Marcel Vandebroek, Grimbergen, and Frieda Sporen, Houthalen, all of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 1, 1985, Ser. No. 750,822

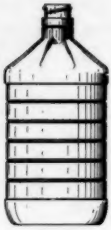
Claims priority, application Benelux, Jan. 4, 1985, 3490-14

Term of patent 14 years

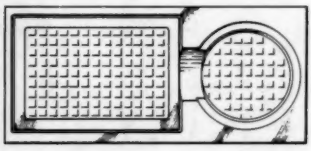
U.S. Cl. D9—370

292,377
BOTTLE
Philippe Pozzo di Borgo, Hautvillers, France, assignor to Campagne Moet & Chandon, Ernay, France
Filed Jun. 3, 1985, Ser. No. 740,626
Term of patent 14 years
U.S. Cl. D9—370

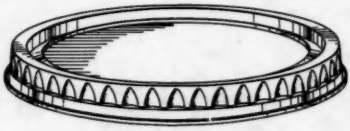
292,378
BOTTLE
Charles M. Brandt, Woodstock, and Claude J. Everette, Marietta, both of Ga., assignors to Sewell Plastics Inc., Atlanta, Ga.
Filed Apr. 8, 1985, Ser. No. 720,993
Term of patent 14 years
U.S. Cl. D9—396



292,379
TRAY FOR HOLDING A PREPACKAGED SNACK
Keith Pollitt, Hazel Grove, England, assignor to Vessen Limited, Cheshire, England
Filed Mar. 21, 1985, Ser. No. 714,483
Claims priority, application Australia, Sep. 21, 1984, 9013/84
Term of patent 14 years
U.S. Cl. D9—347

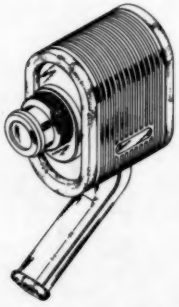


292,380
CONTAINER LID
Ernest L. Smith, Kansas City, Mo., assignor to Sealright Co., Inc., Kansas City, Mo.
Filed Mar. 11, 1985, Ser. No. 710,404
Term of patent 14 years
U.S. Cl. D9—435

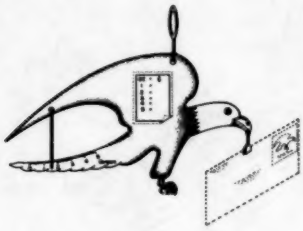


292,381
COMBINED CLOSURE AND MEASURING CUP
Mathias M. Kowollik; Jack A. Sneller, and George S. Speidel, III, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Oct. 9, 1984, Ser. No. 658,730
Term of patent 14 years
U.S. Cl. D9—453

292,382
PYROMETER
Earl Hoyt, Franklin Lakes, N.J., assignor to Quantum Logic Corporation, Secaucus, N.J.
Filed Mar. 13, 1985, Ser. No. 711,268
Term of patent 14 years
U.S. Cl. D10—57

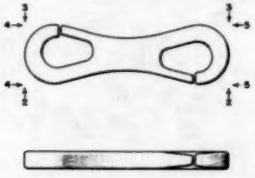


292,383
POSTAL SCALE
George M. Raptis, 17876 Vicino Way, Pacific Palisades, Calif. 90272
Filed Feb. 22, 1985, Ser. No. 704,255
Term of patent 14 years
U.S. Cl. D10—87

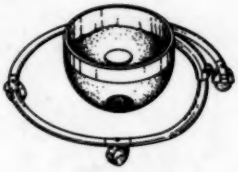


292,384
NOVELTY FIGURINE
Harold D. McLean, 2317 N. Tom Green, Odessa, Tex. 79761
Filed Apr. 19, 1985, Ser. No. 725,078
Term of patent 14 years
U.S. Cl. D11—160

292,385
HOOK FASTENER
Mark J. Udelhofen, Park Ridge, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Jun. 27, 1985, Ser. No. 749,253
Term of patent 14 years
U.S. Cl. D11—210



292,386
INFANT WALKER
Sandra C. Brown, and Benny L. Brown, both of 7 Lakes, Box 620, West End, N.C. 27376
Filed Aug. 16, 1985, Ser. No. 766,396
Term of patent 14 years
U.S. Cl. D12—130

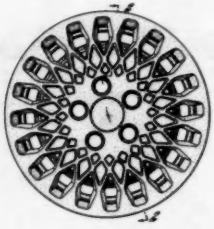


292,387
CAR FRONT BUMPER
Yasuji Oda, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Dec. 6, 1985, Ser. No. 805,559
Term of patent 14 years
U.S. Cl. D12—169

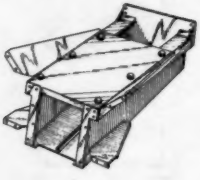
292,388
STEP PLATE
C. Raywood Weiler, 3440 Cathedral Canyon Dr., Palm Springs, Calif. 92234
Filed Dec. 30, 1985, Ser. No. 814,554
Term of patent 14 years
U.S. Cl. D12—203

292,389
WHEEL COVER
William F. Boyle, Sterling Heights, and Maurice P. Chandler, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 20, 1985, Ser. No. 703,394
Term of patent 14 years
U.S. Cl. D12—211

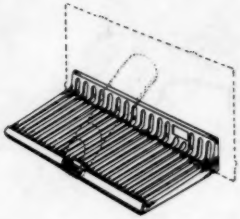
292,390
WHEEL COVER
Richard F. Ruzzin, Grosse Pointe Park, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 4, 1985, Ser. No. 708,005
Term of patent 14 years
U.S. Cl. D12—211



292,391
BRACKET FOR MOUNTING OUTBOARD ENGINE BEHIND BOAT TRANSOM
Ronald D. Schlesch, Stuart, Fla., assignor to Armstrong International Inc., Three Rivers, Mich.
Filed Jan. 9, 1985, Ser. No. 690,030
Term of patent 14 years
U.S. Cl. D12—317

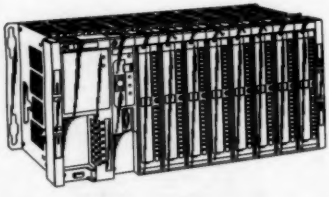


292,392
BOAT LEVELER TRIM TAB
Lawrence P. Zepp, Toledo, Ohio; Christopher C. Dowdey, Grosse Ile, Mich.; Robert B. Riggs, Ypsilanti, Mich., and D. Mark Trostle, Canton, Mich., assignors to International Hydraulic Systems, Inc., Southgate, Mich.
Filed Aug. 6, 1984, Ser. No. 638,293
Term of patent 14 years
U.S. Cl. D12—317

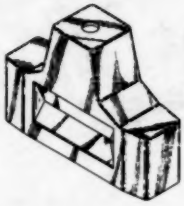


292,393
AIRPLANE
Elbert L. Rutan, Hangar 73 Mojave Airport,, Mojave, Calif. 93501
Filed Aug. 18, 1983, Ser. No. 524,439
Term of patent 14 years
U.S. Cl. D12—332

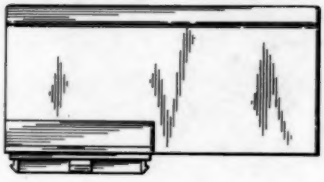
292,394
PROGRAMABLE CONTROLLER
Guy Boucher, Paris, France, assignor to Telemecanique Electrique
Filed Feb. 20, 1985, Ser. No. 703,588
Claims priority, application France, Aug. 24, 1984, 84 3762
Term of patent 14 years
U.S. Cl. D13—12



292,395
BOOT FOR AN ELECTRICAL CONNECTOR
Mark H. Waters, Harrisburg, and Lahman D. Lambert, II, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 19, 1985, Ser. No. 703,019
Term of patent 14 years
U.S. Cl. D13—24

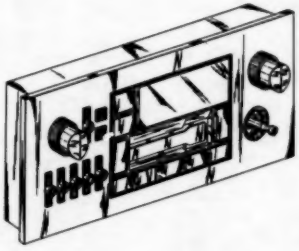


292,396
ADAPTOR FOR A WIRE CHANNEL
David W. Bramwell, Clwyd, Wales, assignor to EGA Limited, United Kingdom
Filed Aug. 17, 1984, Ser. No. 641,974
Claims priority, application United Kingdom, Jun. 26, 1984, 1020643
Term of patent 14 years
U.S. Cl. D13—24

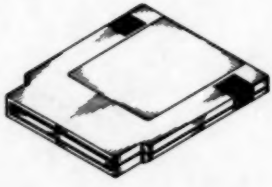


292,397
MODULAR ELECTRICAL PLUG
John M. Poliak, East Meadow; Robert W. Gritz, Bronx, and Juan M. Lopez, Jamaica, all of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Filed Dec. 3, 1984, Ser. No. 677,612
Term of patent 14 years
U.S. Cl. D13—28

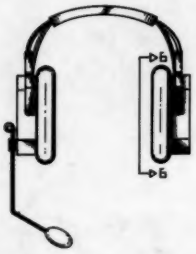
292,398
FRONT CONTROL PANEL FOR A COMBINED VEHICULAR CASSETTE PLAYER AND RADIO RECEIVER
Harlan E. Kifer, Birmingham; Richard C. Litner, Milford; Richard Megregian, Farmington Hills, and Michael G. Moore, Rochester, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.
Filed Jun. 27, 1985, Ser. No. 749,255
Term of patent 14 years
U.S. Cl. D14—10



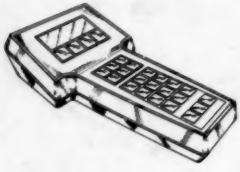
292,399
CARTRIDGE FOR GAME MACHINE
Masayuki Yukawa, Kyoto, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan
Filed Oct. 27, 1986, Ser. No. 923,683
Term of patent 14 years
U.S. Cl. D14—11



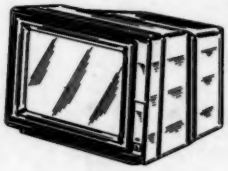
292,400
HEADSET TELEPHONE
Cathy Y. Boggs, and Larry W. Boggs, both of HCR 87, Box 1432, Thornton, Ky. 41855
Filed Jul. 19, 1985, Ser. No. 756,644
Term of patent 14 years
U.S. Cl. D14—53



292,401
HAND HELD DIGITAL COMMUNICATOR HOUSING
David W. Lee, Farmington, Minn., and Logan W. Johnson, Green Valley, Ariz., assignors to Rosemount Inc., Eden Prairie, Minn.
Filed Sep. 27, 1985, Ser. No. 781,360
Term of patent 14 years
U.S. Cl. D14—68



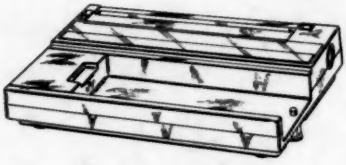
292,402
MONITOR TV SET
Taisuke Saeki, and Harumi Sakamoto, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 12, 1985, Ser. No. 711,080
Claims priority, application Japan, Sep. 13, 1984, 59-38358
Term of patent 14 years
U.S. Cl. D14—80



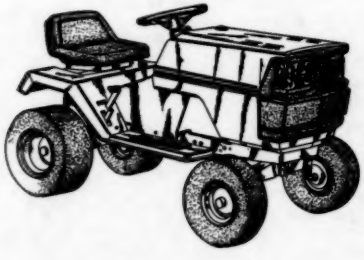
292,403
COMBINATION TELEPHONE AND COMPUTER TERMINAL FOR TELECOMMUNICATION SYSTEM
Marc Renard, Pierrefitte, France, assignor to Matra Communication, Guimper, France
Filed Aug. 20, 1984, Ser. No. 642,153
Claims priority, application France, Mar. 6, 1984, 84 0984
Term of patent 14 years
U.S. Cl. D14—101

292,404
PORTABLE POINT OF SALE CUSTOMER CREDIT CARD ENCODER
Thomas C. Wilson, and James S. Carter, both of Denver, Colo., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Oct. 5, 1984, Ser. No. 657,929
Term of patent 14 years
U.S. Cl. D14—107

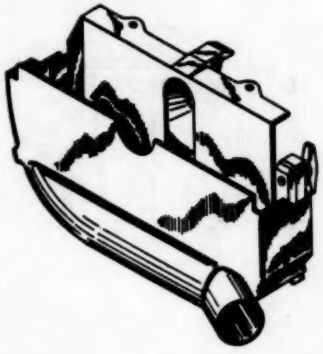
292,405
COMBINED PRINTER AND MEMORY CAPACITY EXPANDER FOR A COMPUTER
Natsu Kitani, Hyogo; Benito Mishiro, Osaka, and Yoshihiko Sugiyama, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 8, 1985, Ser. No. 752,876
Term of patent 14 years
U.S. Cl. D14—111



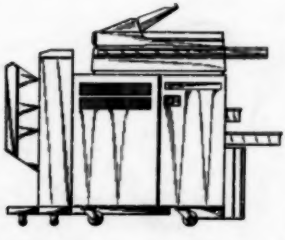
292,406
LAWN TRACTOR
Wayne L. Kruse; Joe Crabtree, both of Franklin, and Keith E. Brightbill, Brentwood, all of Tenn., assignors to The Murray Ohio Manufacturing Company, Brentwood, Tenn.
Filed Feb. 27, 1985, Ser. No. 706,386
Term of patent 14 years
U.S. Cl. D15—23



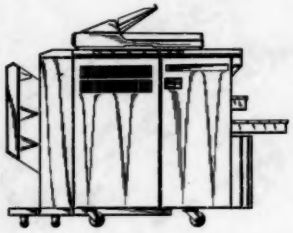
292,407
COMBINED GUARD AND DUST COLLECTOR FOR A TABLE SAW
John G. Legler, Huber Heights; Robert L. Bartlett, and Harold E. Folkerth, both of Dayton, all of Ohio, assignors to Shopsmith, Inc., Dayton, Ohio
Filed Jan. 10, 1985, Ser. No. 690,276
Term of patent 14 years
U.S. Cl. D15—133



292,408
COPIER
Larry D. Harrison, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 18, 1985, Ser. No. 712,816
Term of patent 14 years
U.S. Cl. D16—30



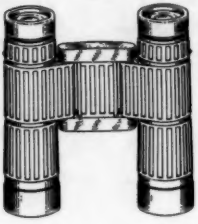
292,409
COPIER
Larry D. Harrison, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 18, 1985, Ser. No. 712,817
Term of patent 14 years
U.S. Cl. D16—30



292,410
EYE SHIELD
Murray D. K. Hunter, 10 Spring St., Balmain, N.S.W. 2041, Australia
Filed Dec. 28, 1984, Ser. No. 687,261
Term of patent 14 years
U.S. Cl. D16—102

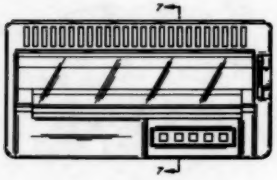
292,411
MONACLE
Trevor I. Baptiste, 383 Grand Ave., Brooklyn, N.Y. 11238
Filed Jul. 30, 1984, Ser. No. 635,627
Term of patent 14 years
U.S. Cl. D16—107

292,412
BINOCULAR
Heinrich Janke, Braunfels; Alfred Hengst, Lahnau, and Hans-Kurt Uellenberg, Edingen, all of Fed. Rep. of Germany
Filed May 23, 1984, Ser. No. 613,254
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 5 MR 248
Term of patent 14 years
U.S. Cl. D16—133

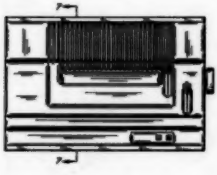


292,413
INSTRUMENT PICK
Dallas W. Slusser, 23026 Ardmore Trail, South Bend, Ind. 46628
Filed Jul. 29, 1985, Ser. No. 759,872
Term of patent 14 years
U.S. Cl. D17—20

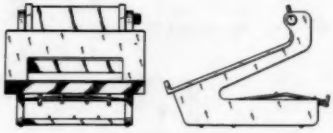
292,414
PRINTER
Takahisa Yubisui, assignor to Sharp Corporation, Osaka, Japan
Filed Jul. 10, 1985, Ser. No. 753,636
Claims priority, application Japan, Jan. 10, 1985, 60-603
Term of patent 14 years
U.S. Cl. D18—13



292,415
PRINTER
Akira Tsukada, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Sep. 11, 1985, Ser. No. 774,815
Claims priority, application Japan, Mar. 14, 1985, 60-10401
Term of patent 14 years
U.S. Cl. D18—13



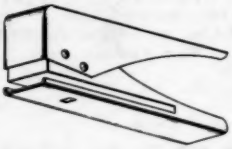
292,416
COMBINED PRINTER STAND AND PAPER REFOLDING APPARATUS
James B. Clark, Oakdale, Calif., assignor to MicroComputer Accessories, Inc., Los Angeles, Calif.
Filed Oct. 1, 1985, Ser. No. 782,308
Term of patent 14 years
U.S. Cl. D18—23



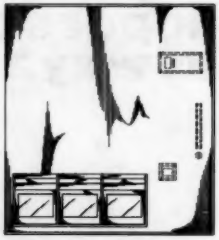
292,417
FONT OF SIGN LETTERS OR THE LIKE
James M. O'Neal, Chatsworth, Calif., assignor to Jim O'Neal Distributing, Inc., Chatsworth, Calif.
Filed Nov. 18, 1985, Ser. No. 805,455
Term of patent 14 years
U.S. Cl. D18—30

292,418
MINIATURE SCHOOL SLATE
Joseph W. Perry, 2933 Forest Park, Garland, Tex. 75042
Filed May 14, 1984, Ser. No. 610,038
Term of patent 14 years
U.S. Cl. D19—52

292,419
CARD PUNCH
Virgil B. Carnahan, R.D. #1, Cresco, Pa. 18326
Filed Nov. 8, 1984, Ser. No. 669,596
Term of patent 14 years
U.S. Cl. D19—72

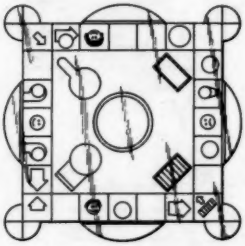


292,420
VENDING MACHINE
Michael J. DelPercio, Fenton, and Charlie R. Holland, St. Louis, both of Mo., assignors to Coin Acceptors, Inc., St. Louis, Mo.
Filed Nov. 19, 1984, Ser. No. 673,126
Term of patent 14 years
U.S. Cl. D20—4



292,421
STORK SIGN
Hugh P. Rafferty, 31 Liberty La., Norwood, Mass. 02062
Filed Jun. 10, 1986, Ser. No. 872,595
Term of patent 14 years
U.S. Cl. D20—30

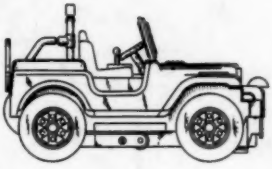
292,422
GAME BOARD
Michael Coffel, 418 W. North St., Warrensburg, Mo. 64093
Filed Mar. 13, 1985, Ser. No. 711,159
Term of patent 14 years
U.S. Cl. D21—33

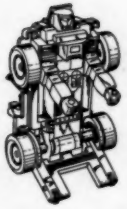


292,423
GAME MACHINE DOOR
David E. Williams; Michael Parham, both of Las Vegas, Nev., and Loren English, Las Vegas, Calif., assignors to Entertainment Technology, Las Vegas, Nev.
Filed Nov. 14, 1984, Ser. No. 670,814
Term of patent 14 years
U.S. Cl. D21—38

292,424
RATTLE
Bryn Jones, 28 Thomas Street, Llanbradach, Caerphilly, Wales
Filed Mar. 7, 1985, Ser. No. 709,427
Claims priority, application United Kingdom, Sep. 21, 1984, 1022173
Term of patent 14 years
U.S. Cl. D21—65

292,425
RECONFIGURABLE TOY VEHICLE
Sang-Kwom Lim, 236 Dongdaeshin-dong, Seo-Ku, Busan, Rep. of Korea
Filed Jan. 16, 1985, Ser. No. 691,916
Claims priority, application Rep. of Korea, Jul. 20, 1984, 8713
Term of patent 14 years
U.S. Cl. D21—150



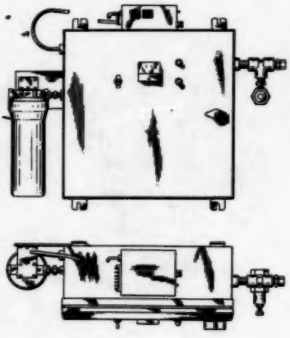


292,426
STUFFED TOY BEAR
Delores M. Winner, 7920 Jefferson St., Munster, Ind. 46321
Filed May 29, 1985, Ser. No. 738,992
Term of patent 14 years
U.S. Cl. D21—159

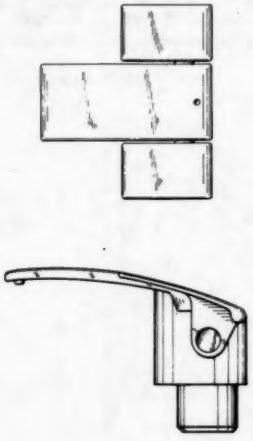
292,427
PHYSICAL EXERCISER
Otakar Baburek, Vienna, Australia, assignor to Tyrolia Freizeitgeraete Gesellschaft m.b.h. & Co. OHG, Schwechat, Australia
Filed Nov. 8, 1985, Ser. No. 803,991
Claims priority, application Austria, May 31, 1985, MR 27/85
Term of patent 14 years
U.S. Cl. D21—198

292,428
FLY SWATTER BLADE
Brian K. Strode, Tillamook, Oreg., assignor to David L. Nelson, St. Cloud, Minn.
Filed May 13, 1985, Ser. No. 733,093
Term of patent 14 years
U.S. Cl. D22—124

292,429
WATER DISINFECTANT AND PURIFICATION UNIT
John Spink, Chesterfield, Mo., assignor to Scienco Inc., St. Louis, Mo.
Filed Sep. 9, 1985, Ser. No. 774,148
Term of patent 14 years
U.S. Cl. D23—209

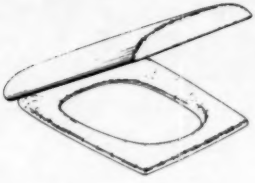


292,430
FAUCET
Axel Enthoven, Wijnegem, Belgium, assignor to American Standard Inc., New York, N.Y.
Filed May 20, 1985, Ser. No. 735,927
Claims priority, application Benelux, Nov. 20, 1984, 03457/01-05
Term of patent 14 years
U.S. Cl. D23—241



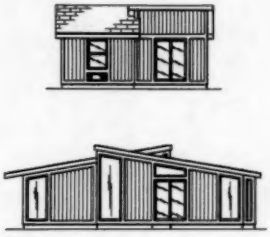
292,431
WATER CLOSET
Herbert V. Kohler, Jr., Kohler, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Apr. 25, 1985, Ser. No. 726,992
Term of patent 14 years
U.S. Cl. D23—301

292,432
COMBINED TOILET SEAT AND COVER, OR SIMILAR ARTICLE
Else J. Rasmussen, Åbyhoj, Denmark, assignor to Dansk Pressalit A/S, Arhus C, Denmark
Filed May 8, 1985, Ser. No. 731,959
Claims priority, application Denmark, Dec. 3, 1984, 1092/84
Term of patent 14 years
U.S. Cl. D23—311



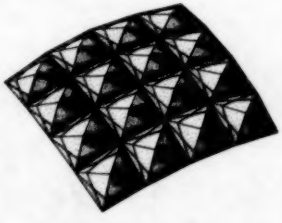
292,433
COMBINED UNITARY DISPOSBLE CYTOLOGY CHAMBER AND FILTER CARD FOR ANALYSIS OF BODY FLUIDS
Daniel V. Griffin, Denver, Colo., assignor to Whale Scientific, Inc., Commerce City, Colo.
Filed Dec. 5, 1984, Ser. No. 678,263
Term of patent 14 years
U.S. Cl. D24—22

292,434
SINGLE FAMILY HOUSE
Lucien R. Downing, Columbus, Ohio, assignor to Cardinal Industries, Inc., Columbus, Ohio
Filed Feb. 12, 1985, Ser. No. 700,722
Term of patent 14 years
U.S. Cl. D25—22



292,435
MODULAR HOME
Richard L. Stevenson, 8158 Manitoba, No. 3, Playa Del Rey, Calif. 90293
Filed Dec. 19, 1986, Ser. No. 943,574
Term of patent 14 years
U.S. Cl. D25—30

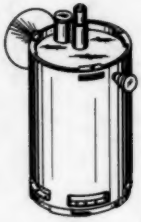
292,436
FACETED ROOF DOME
Donald L. Richter, Rolling Hills Estates, Calif., assignor to Temcor, Torrance, Calif.
Filed Dec. 7, 1984, Ser. No. 679,487
Term of patent 14 years
U.S. Cl. D25—56



292,437
CIGARETTE CASE
John Wind, III, 11202 Royal Palm Way, Boca Raton, Fla. 33432
Filed May 13, 1985, Ser. No. 732,918
Term of patent 14 years
U.S. Cl. D27—48

292,438
FACE MASK FOR TRYING ON CLOTHING WITHOUT SMEARING MAKE-UP
Hattie Lyke, 16214 Plymouth, Markham, Ill. 60426
Filed Nov. 15, 1985, Ser. No. 805,219
Term of patent 14 years
U.S. Cl. D29—17

292,439
AQUARIUM AERATOR
Arno Richter, Osnabrück, Fed. Rep. of Germany, assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Sep. 25, 1984, Ser. No. 654,275
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 29 MR 727
The portion of the term of this patent subsequent to Sep. 1, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—12



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TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF OCTOBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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A.K.G.S. Partnership, A Partnership of Las Vegas: *See*—
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A/S Raufoss Ammunisjonsfabrikker A/S: *See*—
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Maas, Lawrence W.; Geiman, Richard A.; and Adams, Charles T., 4,701,254, Cl. 208-26.000.

Adaway, Timothy J., to Dow Chemical Company, The. Catalyzed alkylation of halopyridinates in the absence of added organic solvents. 4,701,531, Cl. 546-297.000.

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Agapiou, Agapios K.; Muhle, Michael E.; and Kurtzman, Myron B., to Exxon Chemical Patents Inc. Polymerization catalyst, production and use. 4,701,506, Cl. 526-128.000.

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Leenders, Luc H.; Ramon, Charles L.; and Daems, Edie R., 4,701,401, Cl. 430-257.000.

Agliano, William S.: *See*—
Pisz, Frank A.; and Agliano, William S., 4,701,102, Cl. 415-136.000.

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Ishibashi, Kiyoshi; and Ukai, Yujiro, 4,700,545, Cl. 62-6.000.
Mitsumoto, Takashi; Eiermann, Dankwart; and Nuber, Roland, 4,700,740, Cl. 137-512.150.
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Kobayashi, Waichi; Akegi, Seiji; and Iwata, Kazuhiro, 4,701,222, Cl. 106-288.00B.

Akiba, Shigeyuki; Utaka, Katsuyuki; Sakai, Kazuo; and Matsushima, Yuichi, to Kokusai Denshin Denwa Kabushiki Kaisha. Distributed feedback semiconductor laser. 4,701,930, Cl. 372-96.000.

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Heinen, Walter, 4,700,594, Cl. 82-3.000.

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Millot, Jean-Paul; Alibran, Patrice; and Desfontaines, Guy, 4,701,296, Cl. 376-172.000.

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Allebest, Edward F.; Hansen, Parley E.; Walsh, George A.; and Maguire, Walter R., to Resolution Research, Inc. Interactive plural head laser disc system. 4,701,896, Cl. 369-32.000.

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Falciani, Marco; and Bonamigo, Roberto, 4,700,838, Cl. 206-438.000.

Aoki, Masakazu; Horiguchi, Masashi; Nakagome, Yoshinobu; Ikenaga, Shinichi; Shimohigashi, Katsuhiro; Masuhara, Toshiaki; Itoh, Kiyoo; Nakamura, Hideo; and Minato, Osamu, to Hitachi, Ltd. Semiconductor memory for serial data access. 4,701,884, Cl. 365-189.000.

Aoki, Tetsuo: *See*—
Nakajima, Takayuki; Aoki, Tetsuo; Kobayashi, Katsumi; and Akiyama, Noboru, 4,701,918, Cl. 371-20.000.

Aoki, Toshio: *See*—
Suzuki, Kouji; Ikeda, Mitsushi; and Aoki, Toshio, 4,700,458, Cl. 437-83.000.

Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, to Pioneer Electronic Corporation. Automatic loading disc player. 4,701,902, Cl. 369-77.100.

Aoyama, Naofumi: *See*—
Endo, Shyusuke; Aoyama, Naofumi; Yabuuchi, Toshihiko; Sakuma, Toshiyuki; and Kinugawa, Kiyoshige, 4,701,025, Cl. 350-333.000.

Aoyama, Shigeo; and Yamamoto, Yoshinori, to Hitachi Maxwell, Ltd. Magnetic recording medium. 4,701,371, Cl. 428-323.000.

AP Industries, Inc.: *See*—
Harwood, Jon, 4,700,806, Cl. 181-282.000.

Apollo Labeling Systems: *See*—
Jurinak, Edward L., 4,700,631, Cl. 101-350.000.

Apostolos, John T., to Sanders Associates, Inc. Three-dimensional electromagnetic surveillance system and method. 4,701,762, Cl. 342-417.000.

Apparcel, Richard A.: *See*—
McFarland, Ronald F.; and Apparcel, Richard A., 4,700,502, Cl. 43-21.200.

Appel, Stanley H., to Baylor College of Medicine. Diagnosis of Alzheimer disease. 4,701,407, Cl. 435-4.000.

Appelgren, Curt H., to Lejus Medical Aktiebolag. Method for coating granules, pills, and tablets. 4,701,341, Cl. 427-3.000.

Applied Biochemists Inc.: *See*—
Stillman, Neil W.; and Geiger, John T., 4,701,286, Cl. 261-36.100.

Applied Protein Technologies, Inc.: *See*—
Horn, Marcus J.; and Miller, William K., 4,701,304, Cl. 422-62.000.

Applied Science Research Institute: *See*—
Kuwahara, Hideyuki; Kondo, Bunji; Takada, Jun; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,701,301, Cl. 419-21.000.

Aprica Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,700,831, Cl. 206-232.000.

Arai, Masaaki: *See*—
Sasaki, Takayuki; and Arai, Masaaki, 4,701,871, Cl. 364-718.000.

Arai, Ryuichi: *See*—
Sakaki, Mamoru; and Arai, Ryuichi, 4,701,837, Cl. 346-135.100.

Arai, Shoji: *See*—
Hasegawa, Masazumi; Arai, Shoji; and Mizoe, Shinya, 4,701,473, Cl. 521-118.000.

Arakawa, Kazuhiko: *See*—
Ishizaki, Akira; and Arakawa, Kazuhiko, 4,701,626, Cl. 250-578.000.

Arakawa, Masaru; and Numata, Masanori, to Nifco Inc. Method of high frequency welding. 4,701,229, Cl. 156-69.000.

Arakawa, Tatsumi; Ozaki, Masaru; and Ikeda, Yukihiro, to Director-General of Agency of Industrial Science and Technology. Highly electroconductive films and process for preparing same. 4,701,317, Cl. 423-445.000.

Araki, Setsuo: *See*—
Iwamoto, Masayuki; Araki, Setsuo; and Sone, Yasuo, 4,700,626, Cl. 101-230.000.

Arashida, Toshio: *See*—
Sato, Susumu; and Arashida, Toshio, 4,700,497, Cl. 40-531.000.

Ardabatsky, Vladimir P.: *See*—
Volkhin, Nikolai N.; Ardabatsky, Vladimir P.; and Luzin, Valery V., 4,700,468, Cl. 29-623.200.

Arduini, Carlo; Barboni, Renato; Castellani, Antonio; Ponzi, Ugo; Bielli, Paolo; and Contu, Salvatore, to Cselt-Centro Studi e Laboratori Telecommuncazioni S.p.A. Structure for a dichroic antenna. 4,701,765, Cl. 343-897.000.

Arel Control Systems, Ltd.: *See*—
El-Hanany, Uri; Lachish, Uri; Rotter, Shlomo; and Adler, Eli, 4,701,607, Cl. 250-205.000.

Arentsen, Dik, to IHC Holland N.V. Apparatus for withdrawing a tube or pile which has been driven into the soil. 4,701,077, Cl. 405-232.000.

Argento, Benny J.: *See*—
Bailey, Frederick E., Jr.; and Argento, Benny J., 4,701,474, Cl. 521-137.000.

Arias, Jose A., to T & R Chemicals, Inc. Pyrethroid containing pharmaceutical compositions. 4,701,446, Cl. 514-65.000.

Arioka, Hiroyuki: *See*—
Nishimatsu, Masaharu; Takayama, Suguru; and Arioka, Hiroyuki, 4,701,375, Cl. 428-336.000.

Arnott, Eric J. Posterior chamber lens implant. 4,701,181, Cl. 623-6.000.

Arrow Fastener Company, Inc.: *See*—
Wingert, Rudolf, 4,700,876, Cl. 227-131.000.

Arthur A. Collins, Inc.: *See*—
Collins, Arthur A., 4,701,907, Cl. 370-63.000.

Artzt, Peter; Muller, Heinz; Ziegler, Kurt; Egbers, Gerhard; and Wokaun, Jacek, to Schubert & Salzer. Process and apparatus for eliminating dust from fiber material. 4,700,431, Cl. 19-105.000.

Asahi Denka Kogyo Kabushiki Kaisha: *See*—
Endo, Akira; and Yamashita, Haruyuki, 4,701,448, Cl. 514-121.000.

Asahi-Dow Ltd.: *See*—
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,701,496, Cl. 525-240.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Iwasaki, Hirofumi, 4,701,365, Cl. 428-171.000.

Asahi Medical Co., Ltd.: *See*—
Watanabe, Hiroyuki; and Rikumaru, Hiroshi, 4,701,267, Cl. 210-806.000.

Asai, Jiro: *See*—
Takeuchi, Hirotaka; Asai, Jiro; Yamada, Yasuhumi; and Yanase, Sumio, 4,701,692, Cl. 322-90.000.

Asai, Ko; and Morita, Koichiro, to NEC Corporation. Fingerprint input device equipped with a cleaner for finger-impressing surface. 4,701,959, Cl. 382-1.000.

Asakawa, Terushige: *See*—
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,701,608, Cl. 250-205.000.

Asbo, Einar L.: *See*—
Francini, Joseph P.; Asbo, Einar L.; and Boston, Vincent, 4,701,601, Cl. 235-449.000.

ASEA AB: *See*—
Rappinger, Bo; and Stenkvist, Sven-Einar, 4,701,931, Cl. 373-72.000.

Ashizaki, Shigeya; Sugahara, Koichi; Muranishi, Hideo; and Natsuhara, Masao, to Matsushita Electronics Corporation. Color cathode ray tube apparatus. 4,701,677, Cl. 315-382.000.

Ashland Oil, Inc.: *See*—
Bonee, Joseph C., 4,701,219, Cl. 106-118.000.
Walters, Paul W.; and Benslay, Roger M., 4,701,307, Cl. 422-147.000.

Aslami, Mohd: *See*—
Jaeger, Raymond E.; and Aslami, Mohd, 4,701,614, Cl. 250-227.000.

Atal, Bishnu S., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Multipulse LPC speech processing arrangement. 4,701,954, Cl. 381-49.000.

Ateliers de Conceptions et d'Innovations Industrielles: *See*—
Michel, Lucien P., 4,700,450, Cl. 29-527.200.

Atlantic Research Corporation: *See*—
Heine, William M., 4,700,607, Cl. 87-57.000.

Atlantic Richfield Company: *See*—
Castagna, John P.; and Siegfried, Robert W., II, 4,701,891, Cl. 367-31.000.
Dean, Barry D., 4,701,493, Cl. 524-504.000.
Thach, Sophany; Salter, Stephen J.; Meyers, Kevin O.; and Giordano, Ronald M., 4,701,271, Cl. 252-8.554.

Atlantis Projects Inc.: *See*—
Thorndyke, Robert J., 4,701,086, Cl. 410-26.000.

Atochem: *See*—
Decaudin, Robert; Gurtner, Bernard; and Gagnieur, Andre, 4,701,564, Cl. 568-639.000.

Audio Science Investors Limited Partnership: *See*—
Wilkinson, James P.; and Halverson, Thomas R., 4,701,750, Cl. 340-384.00E.

Auge, Karl-Hans: *See*—
Lorenz, Kurt; Dungs, Horst; and Auge, Karl-Hans, 4,701,243, Cl. 201-3.000.

Augelmann, Gerard: *See*—
Regimbeau, Guy; Augelmann, Gerard; and Disdier, Camille, 4,701,560, Cl. 564-404.000.

August, Melvin C.; Bowen, Stephen A.; and Williams, John T., to Cray Research, Inc. ZIE edge connector. 4,700,996, Cl. 439-268.000.

Automatic Roller Doors Australia Pty. Ltd.: *See*—
Seidel, Raymond L.; and Viola, Marian, 4,701,684, Cl. 318-282.000.

Auvil, Steven R.: *See*—
Choe, Jung S.; Auvil, Steven R.; and Agrawal, Rakesh, 4,701,187, Cl. 55-16.000.

Avicom International, Inc.: *See*—
Westall, Michael J., 4,701,814, Cl. 360-72.300.

Avram, Elena: *See*—
Revici, Emanuel, 4,701,442, Cl. 514-21.000.

B.F. Goodrich Company, The: *See*—
Minchak, Robert J.; and Lane, Parley C., Jr., 4,701,510, Cl. 526-283.000.
Percec, Virgil, 4,701,514, Cl. 528-174.000.

Baba, Shigenori: *See*—
Aneha, Nobuhiko; and Baba, Shigenori, 4,701,778, Cl. 357-45.000.

Babcock & Wilcox Company, The: *See*—
Fasnacht, Floyd A., Jr.; Klahn, Frank C.; Schafer, Bruce W.; and Werner, Charles E., 4,700,662, Cl. 122-392.000.

Babel, Werner, to MAHO Aktiengesellschaft. Tool magazine. 4,700,452, Cl. 29-568.000.

Bach, Randall E.: *See*—
Resnick, David R.; and Bach, Randall E., 4,701,920, Cl. 371-25.000.

Baer, Thomas M.; and Keirstead, Mark S., to Spectra-Physics, Inc. Laser diode pumped solid state laser. 4,701,929, Cl. 372-71.000.

Baerg, William; Ting, Chiu H.; Siu, Byron B.; and Tzeng, J. C., to Intel Corporation. Process for forming MOS transistor with buried oxide regions for insulation. 4,700,454, Cl. 437-24.000.

Baetz, Charles N.: *See*—
Dickinson, W. David; and Baetz, Charles N., 4,701,107, Cl. 417-86.000.

Bagga, Madan M.; and Bull, Christopher H., to Ciba-Geigy Corporation. Bonding process using curable epoxide resin adhesive. 4,701,378, Cl. 428-414.000.

Baggett, David: *See*—
Billiet, Colin T.; and Baggett, David, 4,701,258, Cl. 210-232.000.

Baguena, Michel, to S.E.M.T., S.A. Two-fuel injector apparatus for an internal combustion engine. 4,700,672, Cl. 123-299.000.

Bahl, Inder J.; and Griffin, Edward L., to ITT Gallium Arsenide Technology Center. Semiconductor chip housing. 4,701,573, Cl. 174-52.0FP.

Bailey, Frederick E., Jr.; and Argento, Benny J., to Union Carbide Corporation. Reduced reactivity polyols as foam controllers in producing polyurethanes foams. 4,701,474, Cl. 521-137.000.

Bailey, Robert L.; and Howell, Kenneth L., to Minpro Supply, Incorporated. Prefabricated convertible fireplace. 4,700,687, Cl. 126-121.000.

Baird, William C., Jr., to Exxon Research and Engineering Company. Reforming with polymetallic catalysts. 4,701,255, Cl. 208-139.000.

Baker, Peter F.: *See*—
Persicke, Gunter; Child, James R.; and Baker, Peter F., 4,700,815, Cl. 188-286.000.

Baker, Rodney G.; and Lubelski, Daniel P., to Libbey-Owens-Ford Co. Infrared and ultraviolet absorbing glass compositions. 4,701,425, Cl. 501-70.000.

Baker, William E.: *See*—
Gladney, Tommy C.; and Baker, William E., 4,700,421, Cl. 14-69.500.

Bannister, Royston W.: *See*—
Hill, John; Bannister, Royston W.; and Turczanski, Henry, 4,701,735, Cl. 335-282.000.

Banno, Tadashi: *See*—
Akihama, Shigeyuki; Saito, Makoto; Kawamoto, Akio; Banno, Tadashi; Umeki, Yoshihiko; and Nakamura, Takumi, 4,700,518, Cl. 52-309.160.

Banys, Algis R., to Filper Corporation. Mesh bag opener and bag filling system. 4,700,755, Cl. 141-114.000.

Baradel, Agostino; Guerriero, Renato; and Veronese, Giuseppe, to Consiglio Nazionale Delle Richerche. Process for separating arsenic from acid solutions containing it. 4,701,311, Cl. 423-87.000.

Barb, Gayle E., to Anchor/Darling Valve Company. Control valve for high pressure fluids. 4,700,746, Cl. 137-625.280.

Barber, Larry J., to Olin Corporation. Process for manufacturing bumped tape for tape automated bonding and the product produced thereby. 4,701,363, Cl. 428-137.000.

Barboni, Renato: *See*—
Arduini, Carlo; Barboni, Renato; Castellani, Antonio; Ponzi, Ugo; Bielli, Paolo; and Contu, Salvatore, 4,701,765, Cl. 343-897.000.

Bargholtz, William E.; and Molison, Robert E., to Elsner Engineering Works, Inc. Roll banding machine and method. 4,700,529, Cl. 53-399.000.

Barker, Martyn C.; and Rowlands, Edward G., to Johnson Matthey Public Limited Company. Compositions comprising inorganic particles. 4,701,218, Cl. 106-114.000.

Barlow, Gordon A., to Gordon Barlow Design. Timing mechanism. 4,701,056, Cl. 368-89.000.

Barnes, Harold E., to U.S. Philips Corporation. Electroacoustic calling device with universal bearing supporting a sound aperture closure member. 4,701,749, Cl. 340-384.00R.

Barnett, Ronald E.: *See*—
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,701,552, Cl. 562-498.000.

Baron, Paul C. Method and apparatus for recovering liquids from a well bore. 4,700,783, Cl. 166-372.000.

Barrett, Douglas J., to Eikonix Corporation. Imaging large documents. 4,701,809, Cl. 358-293.000.

Barrett, John P.; Schulz, Daniel R.; Kent, David E.; deFasselle, Robert J.; and Zega, Henry E., to Barrett, John P. Dispensing system. 4,700,884, Cl. 236-12.120.

Barrett, Michael E., to Singer Company, The. Cutter head assembly for power planer. 4,700,481, Cl. 30-475.000.

Barth, Joseph J.: *See*—
Seeley, Robert L.; Barth, Joseph J.; and Clayton, Gerald H., II, 4,701,712, Cl. 324-340.000.

Barthelemy, Pierre: *See*—
Mendy, Francois; and Barthelemy, Pierre, 4,701,468, Cl. 514-547.000.
Mendy, Francois; and Barthelemy, Pierre, 4,701,469, Cl. 514-547.000.

Bartl, Knut: *See*—
Portenhauser, Rudolf; and Bartl, Knut, 4,701,417, Cl. 436-13.000.

Barton, Jeffrey N.: *See*—
Suh, John T.; and Barton, Jeffrey N., 4,701,461, Cl. 514-317.000.

Bartusek, Robert J.; Steilen, Ronald M.; and Rettig, Vernon E., to Deere & Company. Furrow opener assembly with integral downpressure adjustment. 4,700,785, Cl. 172-705.000.

BASF Aktiengesellschaft: *See*—
Bay, Herbert; Widder, Rudi; and Eckert, Guenter, 4,701,269, Cl. 252-8.570.
Bewert, Wolfgang; and Kiefer, Hans, 4,701,546, Cl. 558-445.000.

Basler Electric Company: *See*—
Fernandez, Manuel; and Frierdich, Waldo J., 4,701,690, Cl. 322-28.000.

Bass, Vance R.; Bonebrake, Veronica A.; Garrison, David A.; Landis, James K.; Neff, Mary S.; Urquhart, Robert J.; and Williams, Susan C., to International Business Machines Corporation. Compound word spelling verification. 4,701,851, Cl. 364-419.000.

Bassi, Pawan K.: *See*—
Omid, Ahmad; and Bassi, Pawan K., 4,701,205, Cl. 71-78.000.

Basten, Julie T.: *See*—
Ellis, Louise C.; Fahrenkrug, Anne M.; Basten, Julie T.; and Milner, James D., 4,701,177, Cl. 604-385.00A.

Bastian, John M.; Pflieger, David C.; and Beck, Marshall K., to Hamilton Industries, Inc. Cantilever arm assembly for modular furniture. 4,700,916, Cl. 248-225.200.

Bates, Kenneth W.; and Griffiths, William A., to Injectall Limited. Apparatus for introducing substances into liquids e.g. metal melts. 4,701,215, Cl. 75-53.000.

Batina, William P.; and Gipson, Lamar H., to Cordis Corporation. Pulse to sine wave/sample decoder telemetry system. 4,700,707, Cl. 128-419.0PT.

Battelle Memorial Institute: *See*—
Harrison, Harold D.; and Tuten, James M., 4,701,866, Cl. 364-550.000.

Bauer, Eric, to Caracteres S.A. Needle-carrying head for a printing machine. 4,700,625, Cl. 101-93.050.

Bauer, Friedrich; and Kuhnelt, Herbert, to Hoerbiger Ventilwerke Aktiengesellschaft. Cylinder tube strain measurement feedback for piston position control. 4,700,610, Cl. 91-390.000.

Baumberger, Peter, to Sulzer Brothers Limited. Heat exchanger system. 4,700,772, Cl. 165-103.000.

Baumgartner, George C. Surgical implantation method and apparatus. 4,700,692, Cl. 128-1.200.

Baumgartner, Hans-Ulrich; Calderara, Reto; and Sonderegger, Hans-Conrad, to Kristal Instruments AG. Piezoelectric transducer for low forces. 4,701,660, Cl. 310-338.000.

Bausch & Lomb Incorporated: *See*—
Braun, Alan J.; Smith, Lawrence M.; and Wildman, Kelvin H., 4,701,597, Cl. 219-521.000.
Cook, William H.; Deichert, William G.; Wrue, Richard J.; and Westfall, Norman R., 4,701,288, Cl. 264-1.400.
Neefe, Charles W., 4,701,038, Cl. 351-162.000.

Baxter Travenol Laboratories, Inc.: *See*—
Nelson, Deanna; and Rowe, Bruce, 4,701,443, Cl. 514-23.000.

Bay, Herbert; Widder, Rudi; and Eckert, Guenter, to BASF Aktiengesellschaft. Waterproofing leather and skins. 4,701,269, Cl. 252-8.570.

Bayer Aktiengesellschaft: *See*—
Brunn, Horst; Schulten, Gerd-Hermann; and Fuhr, Werner, 4,701,221, Cl. 106-304.000.
Dicke, Hans-Rudolf; Bottenbruch, Ludwig; Wedemeyer, Karl-fried; Paetz, Klaus-Christian; and El Sayed, Aziz, 4,701,515, Cl. 528-176.000.
Hendricks, Udo W.; and Schmidt, Adolf, 4,701,284, Cl. 260-513.00N.
Kauth, Hermann; Schmidt, Manfred; Freitag, Dieter; Rudolph, Udo; and Kleiner, Frank, 4,701,554, Cl. 564-14.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Hagen, Hans, 4,700,424, Cl. 15-250.040.

Bayerisches Leichtmetallwerk Graf Blucher von Wahlstatt GmbH: *See*—
Schmid, Anton; Tauschek, Georg; Sedlmeier, Andreas; and Pollok, Peter, 4,700,446, Cl. 29-159.200.

Baylor College of Medicine: *See*—
Appel, Stanley H., 4,701,407, Cl. 435-4.000.

BBC Brown, Boveri & Company, Limited: *See*—
Haditsch, Werner, 4,701,648, Cl. 310-61.000.

Be, Anh: *See*—
Narula, Dipak; Be, Anh; and Zemanek, Charles P., 4,701,380, Cl. 428-447.000.

Beam, John W.; and Paquette, Edmund T., to Wright Line, Incorporated. Decorative sound absorbing panel for furniture. 4,701,066, Cl. 403-298.000.

Beardow, Terence, to BVT Limited. Apparatus for sputter coating discs. 4,701,251, Cl. 204-298.000.

Beasley, James P., to U.S. Philips Corporation. Charged particle beam apparatus. 4,701,623, Cl. 250-492.200.

Beaubien, Randall S.; and Erps, Lorri A., to Hughes Aircraft Company. Process for making a T-gated transistor. 4,700,462, Cl. 437-187.000.

Beck, Christian A.; Breslawsky, Marc C.; and Forster, Hans R., to Pitney Bowes Inc. Method for folding and sealing sheets. 4,701,233, Cl. 156-217.000.

Beck, Marshall K.: *See*—
Bastian, John M.; Pflieger, David C.; and Beck, Marshall K., 4,700,916, Cl. 248-225.200.

Becker, Bernard: *See*—
Maghon, Helmut; and Becker, Bernard, 4,701,124, Cl. 431-284.000.

Beckman, Leo H. J. F.; and Oomea, Gysbert L., to B.V. Optische Industrie "De Oude Delft". Measuring system employing a measuring method based on the triangulation principle for the non-contact measurement of a distance from the surface of a contoured object to a reference level. . 4,701,049, Cl. 356-1.000.

Becton, Dickinson and Company: *See*—
Larue, Roderick W.; Aebersold, Werner; and Eckel, Robert, 4,701,664, Cl. 313-112.000.

Beech, Brian; Rust, Jeff; Meilach, Alan; and LeVasseur, Rod, to Data Card Corporation. System for entering initializing data on the rear face of an integrated chip card. 4,701,600, Cl. 235-375.000.

Beggs, Louis C.; and D'Entremont, John R., to Texas Instruments Incorporated. Protected refrigerator compressor motor systems and motor protectors therefor. 4,701,824, Cl. 361-24.000.

Behr, Raymond D.; and Zieke, Larry M., to Dow Chemical Company, The. Thermoplastic film with integral closures and reclosable container formed therefrom. 4,701,358, Cl. 428-35.000.

Beisswanger, Rudolf; Wohrle, Albert, deceased (by Wohrle, Ingrid, executor); and Plomer, Anton, to J. M. Voith, GmbH. Device for coating traveling material. 4,700,658, Cl. 118-67.000.

Belanger, John. Multi-purpose camping tool. 4,700,420, Cl. 7-114.000.

Bell, Clifford, to Keystone International, Inc. Data system. 4,701,938, Cl. 375-36.000.

Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, to Enichem Sintesi S.p.A. Catalyst of silicon and titanium having high mechanical strength and a process for its preparation. 4,701,428, Cl. 502-8.000.

Beloit Corp.: *See*—
Wedel, Gregory L.; Fosler, Robert C.; and Garvin, Stanley P., Jr., 4,700,493, Cl. 34-48.000.

Benderly, Asaf A.: *See*—
Campagnulo, Carl J.; and Benderly, Asaf A., 4,701,835, Cl. 362-192.000.

Bendix Engine Components Limited: *See*—
Cook, John E., 4,700,750, Cl. 138-46.000.

Bennett, C. Richard: *See*—
Mundell, Robert D.; and Bennett, C. Richard, 4,700,697, Cl. 128-75.000.

Bennett, Douglas L.; Ludwig, Keith A.; and Schwarz, Alexander, to Air Products and Chemicals, Inc. Multi-zone boiling process and apparatus. 4,700,771, Cl. 165-1.000.

Bennett, Robert A., to Anchor Hocking Corporation. Plastic enclosure having living hinges. 4,700,858, Cl. 215-237.000.

Benslay, Roger M.: *See*—
Walters, Paul W.; and Benslay, Roger M., 4,701,307, Cl. 422-147.000.

Benson, David A.; and Kuswa, Glenn W., to United States of America, Energy. Optically-energized, emp-resistant, fast-acting, explosion initiating device. 4,700,629, Cl. 102-201.000.

Bercovici, Daniel; Gaertner, Hubert; and Puigserver, Antoine, to A.E.C. Societe de Chimie Organique et Biologique. Compositions for feeding animals. 4,701,328, Cl. 426-2.000.

Bereczki, Gabor: *See*—
Tari, Gabor; Bereczki, Gabor; and Blaskovics, Ferenc, 4,700,691, Cl. 128-1.00R.

Berezoutzky, Georges, to Societe Francaise de Stockage Geologique - Geostock. Draining well for an underground cavity for storing liquefied gas under pressure. 4,701,072, Cl. 405-53.000.

Berger, Wolfram: *See*—
Michalski, Bernhard; Lau, Jurgen; and Berger, Wolfram, 4,700,569, Cl. 73-290.00V.

Berkenhoff GmbH: *See*—
Dommer, Erich; Rechtziegel, Bruno; and Tauber, Klaus, 4,701,302, Cl. 420-470.000.

Berman, Carol B.: *See*—
Evans, Thomas L.; and Berman, Carol B., 4,701,519, Cl. 528-371.000.

Bernard, Emile C., to Minnesota Mining and Manufacturing Company. Heat shrink package handle. 4,700,528, Cl. 53-398.000.

Bernath, Oskar, to Georg Fischer Aktiengesellschaft. Device for trimming the edges of veneer. 4,700,758, Cl. 144-118.000.

Bernhagen, James R.; Crabb, Elmer R.; Murphy, Marilyn S.; Roley, Daniel G.; St. Germain, Gene R.; and Tunnell, James H., to Caterpillar Inc. Vehicle steering apparatus. 4,700,794, Cl. 180-6.440.

Bernstein, Joel E., to Soft Sheen Products, Inc. Liquid detergent with sunscreen agent. 4,701,321, Cl. 424-60.000.

Berol Kemi AB: *See*—
Koll, Juhan, 4,701,434, Cl. 502-230.000.

Berry, Vernon D., to Logan Western Road, Inc. Drag-type road grader. 4,700,786, Cl. 172-799.500.

Berryman, Leslie N.; Davis, Gail F.; and Horinek, Herbert J., to Halliburton Company. Transportable material conveying apparatus. 4,701,095, Cl. 414-332.000.

Bert, Wesley J. Temperature sensing system for automatic transmissions. 4,701,741, Cl. 340-57.000.

Bertho, Dominique: *See*—
Bricaud, Herve; and Bertho, Dominique, 4,701,829, Cl. 361-386.000.

Bessette, Ramon L., to Ford Motor Company. Anti-backlash gear mechanism. 4,700,582, Cl. 74-409.000.

Betz Laboratories, Inc.: *See*—
Chen, Fu, 4,701,262, Cl. 210-699.000.

Bewert, Wolfgang; and Kiefer, Hans, to BASF Aktiengesellschaft. Preparation of 2-(N-formylamino)-propionitrile. 4,701,546, Cl. 558-445.000.

Biagini, Guido, to Sundstrand Corporation. On-board refrigerant charging system. 4,700,549, Cl. 62-149.000.

Bianchi, Francois; Busa, Denis; and Fourrey, Francois, to Cycles Peugeot. Device for controlling the relative displacement of two elements, in particular for a vehicle seat structure. 4,700,587, Cl. 74-527.000.

Bicknell, William H.: *See*—
Alley, Robert P.; and Bicknell, William H., 4,701,680, Cl. 315-287.000.

Bielka, Robert P.: *See*—
Kelly, L. Thomas; Hamel, Esther V. M.; and Bielka, Robert P., 4,701,180, Cl. 604-891.000.

Bielli, Paolo: *See*—
Arduini, Carlo; Barboni, Renato; Castellani, Antonio; Ponzi, Ugo; Bielli, Paolo; and Contu, Salvatore, 4,701,765, Cl. 343-897.000.

Bigham, Eric C.: *See*—
Nichol, Charles A.; Reinhard, John F., Jr.; Smith, Gary K.; and Bigham, Eric C., 4,701,455, Cl. 514-249.000.

Bijur Lubricating Corp.: *See*—
Taylor, Herbert, 4,700,866, Cl. 220-316.000.

Billiet, Colin T.; and Baggett, David, to Domnick Hunter Filters Limited. Filter housings. 4,701,258, Cl. 210-232.000.

Bills, Joseph W.; and Moller, William D., to Dakota Mfg. Co., Inc. Cable wheel handling and transporting trailer. 4,701,098, Cl. 414-502.000.

Bingo, Hideyuki: *See*—
Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; Bingo, Hideyuki; Kazusaka, Shoji; and Konishi, Keisuke, 4,701,582, Cl. 200-61.420.

Bio Separation Limited: *See*—
Gibbs, Dudley F.; Greenhalgh, Marilyn E.; Watson, James H. P.; Yeo, Richard G.; and Ellwood, Derek C., 4,701,261, Cl. 210-606.000.

Bird, John M.: *See*—
McDougall, Ian L.; and Bird, John M., 4,701,736, Cl. 335-299.000.

Birkle, Siegfried; and Gehring, Johann, to Siemens Aktiengesellschaft. Apparatus for electrolytic surface treatment of bulk goods. 4,701,248, Cl. 204-201.000.

Birrittella, Mark S.; and Stipanuk, James J., to Motorola, Inc. Bipolar RAM cell. 4,701,882, Cl. 365-154.000.

Bixby, James L.: *See*—
Humphreys, Paula L.; Dietsche, Thomas J.; and Bixby, James L., 4,701,532, Cl. 546-345.000.

Black & Decker Inc.: *See*—
Miller, Walter E., 4,701,599, Cl. 219-544.000.

Blacker, Allen P.; and Chiodi, Wayne R., to Zenith Electronics Corporation. Electron gun system with dynamic focus and dynamic convergence. 4,701,678, Cl. 315-382.000.

Blackwell, James C.: *See*—
Mate, Robert D.; Parker, Dane K.; and Blackwell, James C., 4,701,507, Cl. 526-208.000.

Blades, Russell: *See*—
Roche, Richard G.; and Blades, Russell, 4,700,548, Cl. 62-139.000.

Blaskovics, Ferenc: *See*—
Tari, Gabor; Bereczki, Gabor; and Blaskovics, Ferenc, 4,700,691, Cl. 128-1.00R.

Blattner, Rudolf, to Ciba-Geigy Corporation. Process for the preparation of anthraquinone imides. 4,701,281, Cl. 260-367.000.

Blendick, Leonard E.: *See*—
Miniaioff, Joseph M.; Blendick, Leonard E.; and McCavour, Thomas C., 4,700,511, Cl. 52-1.000.

Blomquist, Arthur G.: *See*—
Harris, Robert M.; and Blomquist, Arthur G., 4,700,653, Cl. 114-316.000.

Blue Mountain Products, Inc.: *See*—
Cunning, Joseph M., 4,700,892, Cl. 239-289.000.

Board of Trustees, Leland J. Stanford University: *See*—
Fan, Tso Y.; and Byer, Robert L., 4,701,928, Cl. 372-68.000.

Boebert, William E.; and Kain, Richard Y., to Honeywell Inc. Secure data processing system architecture. 4,701,840, Cl. 364-200.000.

Boecker, Wolfgang D. G.; Hailey, Laurence N.; and McMurtry, Carl H., to Stemcor Corporation. Sintered silicon carbide ceramic body of high electrical resistivity. 4,701,427, Cl. 501-92.000.

Boehringer Mannheim GmbH: *See*—
Portenhauser, Rudolf; and Bartl, Knut, 4,701,417, Cl. 436-13.000.

Boeing Company, The: *See*—
Geithman, Glenn A.; and Gilbert, Dennis H., 4,700,575, Cl. 73-642.000.
Shemeta, Paul J.; and Hendricks, Daniel A., 4,700,471, Cl. 29-809.000.

Boeniger, Hanspeter, to Georg Utz AG. Automatic coupling for model rail vehicles. 4,700,855, Cl. 213-75.0TC.

Bogan, Gary W.; Lucas, Peter A.; and Monnerat, Georgia A., to Dow Chemical Company, The. Durable epoxy resin. 4,701,481, Cl. 523-428.000.

Bogardus, David W.; Teitzel, Robin L.; and Chapman, David D., to Tektronix, Inc. Retargetable buffer probe. 4,701,696, Cl. 324-73.00R.

Bogdan, Teofil: *See*—
Preissinger, Norbert; and Bogdan, Teofil, 4,701,738, Cl. 336-92.000.

Boge GmbH: *See*—
Moser, Bernd, 4,700,812, Cl. 188-1.110.

Bogle, Normann, to Wilhelm Bogle KG. Profile sensing arrangement. 4,700,487, Cl. 33-175.000.

Bogner, Erwin. Single item vending machine. 4,700,869, Cl. 221-229.000.

Boland, Leona G.; Zehner, Georgia L.; and Stevens, Robert A., to Kimberly-Clark Corporation. Form-fitting self-adjusting disposable garment with a zoned stretchable outer cover. 4,701,171, Cl. 604-385.00A.

Boland, Leona G.; and Stevens, Robert A., to Kimberly-Clark Corporation. Form-fitting self-adjusting disposable garment with elastic waist and legs. 4,701,175, Cl. 604-385.00A.

Boland, Leona G.: *See*—
Wilson, John C.; Stevens, Robert A.; Boland, Leona G.; Rajala, Gregory J.; and Kellenberger, Stanley R., 4,701,170, Cl. 604-385.00A.
Zehner, Georgia L.; Boland, Leona G.; and Stevens, Robert A., 4,701,173, Cl. 604-385.00A.

Bolmstedt, Ulf; and Johansson, Bjorn-Olow, to Alfa-Laval Food & Dairy Engineering AB. Inlet device in plate evaporator. 4,700,770, Cl. 165-1.000.

Bonamigo, Roberto: *See*—
Falciani, Marco; and Bonamigo, Roberto, 4,700,838, Cl. 206-438.000.

Bonebrake, Veronica A.: *See*—
Bass, Vance R.; Bonebrake, Veronica A.; Garrison, David A.; Landis, James K.; Neff, Mary S.; Urquhart, Robert J.; and Williams, Susan C., 4,701,851, Cl. 364-419.000.

Bonee, Joseph C., to Ashland Oil, Inc. Inhibiting leaching of metals from catalysts and sorbents and compositions and methods therefor. 4,701,219, Cl. 106-118.000.

Bonicel, Jean-Pierre, to Les Cables de Lyon. Connection between an optical fiber cable and a junction box, and a method of making the connection. 4,701,014, Cl. 350-96.200.

Bonitz, Jorg; Entenmann, Robert; Miller, Bernhard; Rauch, Hans; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, to Robert Bosch GmbH. Engine knock control method and system with fail-safe mode. 4,700,677, Cl. 123-425.000.

Bonye, Gordon R., to Rank Electronic Tubes Limited. Cathode ray tube. 4,701,789, Cl. 358-65.000.

Borden, Inc.: *See*—
Nelson, Catherine E.; Crowley, Dennis E.; and Weatherford, Wayne M., 4,701,329, Cl. 426-74.000.

Borg, Arthur N., to Zenith Electronics Corporation. Video display terminal with multi frequency dot clock. 4,701,753, Cl. 340-731.000.

Borg-Warner Corporation: *See*—
Dockus, Kostas F.; and Zambrow, John L., 4,701,127, Cl. 432-242.000.

Borges, Michael. Propulsion device for swimmers and divers. 4,700,654, Cl. 114-338.000.

Borgstroem, Leonard: *See*—
Inge, Claes; Lagerstedt, Torgny; Borgstroem, Leonard; Carlsson, Claes-Goeran; Naebo, Sven-Olof; Moberg, Hans; and Franzen, Peter, 4,701,158, Cl. 494-74.000.

Bornhorst, James M., to Vari-Lite, Inc. Ventilation system for stage light instrument. 4,701,833, Cl. 362-299.000.

Borsig GmbH: *See*—
Kehrer, Wolfgang, 4,700,773, Cl. 165-134.100.

Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, to Allied Corporation. Method of facing using homogeneous, ductile nickel based hardfacing foils. 4,701,356, Cl. 427-423.000.

Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, to Allied Corporation. Homogeneous, ductile cobalt based hardfacing foils. 4,701,357, Cl. 427-423.000.

Bosnyak, Robert J.: *See*—
Chan, Albert; Fitzpatrick, Mark; Goddard, Don; Bosnyak, Robert J.; and Tsui, Cyrus, 4,701,695, Cl. 324-510.000.

Boston University, Trustees of: *See*—
Chou, Iih-Nan, 4,701,406, Cl. 435-7.000.
Ryser, Hugues J.; and Shen, Wei-Chiang, 4,701,521, Cl. 530-322.000.

Boston, Vincent: *See*—
Francini, Joseph P.; Asbo, Einar L.; and Boston, Vincent, 4,701,601, Cl. 235-449.000.

Bottenbruch, Ludwig: *See*—
Dicke, Hans-Rudolf; Bottenbruch, Ludwig; Wedemeyer, Karifried; Paetz, Klaus-Christian; and El Sayed, Aziz, 4,701,515, Cl. 528-176.000.

Boucher, Ronald H., to Crathern Engineering Co., Inc. Wrapping machine. 4,701,238, Cl. 156-479.000.

Bourbon, Philippe: *See*—
Bueno, Serge; and Bourbon, Philippe, 4,701,912, Cl. 370-94.000.

Bourrieres, Pierre, to Manufacture d'Appareillage Electrique de Cahors. Cable support for an electric power-line pole. 4,701,577, Cl. 174-45.00R.

Bowen, Stephen A.: *See*—
August, Melvin C.; Bowen, Stephen A.; and Williams, John T., 4,700,996, Cl. 439-268.000.

Bowers, R. H. Triple view mirror system. 4,701,036, Cl. 350-622.000.

Boxhoorn, Gosse; Klazinga, Aan H.; and Velthuis, Otto M., to Shell Oil Company. Ethylene oxide catalyst. 4,701,437, Cl. 502-348.000.

Bozzio, Terry. Electronic drum. 4,700,602, Cl. 84-1.140.

Bradley, Ralph H., Jr., to North American Philips Consumer Electronics Corp. Rear projection screen with improved luminance uniformity. 4,701,020, Cl. 350-128.000.

Brady, Arthur; Kristen, Ulrich; Angerer, Hermann F.; and Regenass, Franz, to Ciba-Geigy Corporation. Lubricant compositions containing antioxidants, amine phosphates and 4- (5-) methyl-1-[di-(2-ethylhexyl) aminomethyl]-benzotriazole. 4,701,273, Cl. 252-32.500.

Brady, Arthur R., to Sundstrand Data Control, Inc. Structure and method for mounting an aircraft weight sensor within tubular axle of an aircraft undercarriage. 4,700,910, Cl. 244-1.00R.

Bramer, Charles, to Lacks Industries, Inc. Remote control rear view mirror, electrically operated. 4,701,037, Cl. 350-634.000.

Branscomb Corporation N.V.: *See*—
Sullivan, Leroy J., 4,700,630, Cl. 102-439.000.

Bratton, Ronald E.; Gigandet, Richard W.; Henke, Mitchell C.; Kaminski, Daniel S.; and Wibel, Michelle A., to Lincoln Foodservice Products, Inc. Impingement and steam oven apparatus for preparing food products. 4,701,340, Cl. 426-511.000.

Braun, Alan J.; Smith, Lawrence M.; and Wildman, Kelvin H., to Bausch & Lomb Incorporated. Portable contact lens disinfecting apparatus. 4,701,597, Cl. 219-521.000.

Braun, David B., to Union Carbide Corporation. Process for flocculating taconite tailings. 4,701,264, Cl. 210-734.000.

Braun, Ernst, to SKF-Textilmaschinen-Komponensten GmbH. Drive device, particularly for textile machines. 4,701,652, Cl. 310-112.000.

Brawn, Ronald J.: *See*—
Groshong, LeRoy E.; and Brawn, Ronald J., 4,701,166, Cl. 604-247.000.

Brazant, James F.: *See*—
Eaton, Favre E.; Brazant, James F.; and Thornton, Lawrence E., 4,701,713, Cl. 324-442.000.

Breil, James J. Method and apparatus for bicycle noise making system. 4,701,149, Cl. 446-404.000.

Brenner, Robert A.: *See*—
Werner, Kurt; Malchow, Gregory L.; Carr, Keith E.; and Brenner, Robert A., 4,700,492, Cl. 34-32.000.

Breslawsky, Marc C.: *See*—
Beck, Christian A.; Breslawsky, Marc C.; and Forster, Hans R., 4,701,233, Cl. 156-217.000.

Bresser, Robert E.; Mesch, Keith A.; and Wursthorn, Karl R., to Morton Thiokol, Inc. Stabilizer compositions for PVC resins. 4,701,486, Cl. 524-182.000.

Bretthauer, Karlheinz; and Obenauf, Hans-Dietrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for regulating the electrodes in a furnace having freely burning electric arcs. 4,701,932, Cl. 373-104.000.

Breunig, Donald E. Exercise Device. 4,700,946, Cl. 272-134.000.

Breville R & D Pty. Limited: *See*—
McClean, John W., 4,700,901, Cl. 241-37.500.

Bricaud, Herve; and Bertho, Dominique, to Amphenol Corporation. Thermal connector for printed circuit card equipped with electronic components. 4,701,829, Cl. 361-386.000.

Bricaud, Herve: *See*—
L'Henaff, Patrick; and Bricaud, Herve, 4,700,743, Cl. 137-560.000.

Bridgestone Corporation: *See*—
Endo, Kazuyuki; Taniguchi, Motoaki; Takahashi, Masanobu; Yamada, Shigeki; and Kato, Kenshiro, 4,700,764, Cl. 152-526.000.

Bristol, James A.: *See*—
Sircar, Ila; and Bristol, James A., 4,701,453, Cl. 514-222.000.

Bristol-Myers Company: *See*—
Meanwell, Nicholas A.; and Wright, John J., 4,701,459, Cl. 514-293.000.
Thompson, Michael D.; and Madding, Gary D., 4,701,528, Cl. 544-278.000.

British-American Tobacco Company Limited: *See*—
Horsewell, Henry G.; and Duke, Martin G., 4,700,724, Cl. 131-336.000.

British Steel Corporation: *See*—
Spenceley, Gene D.; and Welbourn, Brian C., 4,701,216, Cl. 75-59.100.

Brizzi, Marco: *See*—
Mattei, Riccardo; and Brizzi, Marco, 4,700,825, Cl. 198-419.000.

Broihanne, Georges; and Magnier, Pierre, to U.C.P.I. Societe pour l'Utilisation des Ceramiques et des Platres dans l'Industrie; and Messier Fonderie D'Arudy. Metal casting process using a lost pattern, moulds for performing this process and process for the production of said moulds. 4,700,768, Cl. 164-361.000.

Broken Hill Proprietary Co., Ltd., The: *See*—
Swinkels, Dominicus A.; Fredericks, Peter M.; and Osborn, Paul R., 4,701,838, Cl. 364-164.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Kamiya, Osamu, 4,700,646, Cl. 112-279.000.
Komiya, Ryohei; and Terazawa, Masaaki, 4,701,768, Cl. 346-74.400.
Kurachi, Hisao; Minaminaka, Kazuyoshi; Ito, Takeo; and Yamakawa, Kiyoshi, 4,701,579, Cl. 200-5.00A.
Yoshimoto, Satoshi, 4,701,687, Cl. 318-696.000.

Brothers, Lance E., to Halliburton Services. Method of reducing fluid loss in cement compositions which may contain substantial salt concentrations. 4,700,780, Cl. 166-293.000.

Brown, Boveri & Cie AG: *See*—
Weidenauer, Werner; Leukel, Bernd; and Bunk, Klaus, 4,700,879, Cl. 228-123.000.

Brown, Eric W.; and Tai, Henry T., to I-Flow Corporation. Multilumen catheter set. 4,701,159, Cl. 604-43.000.

Brown & Williamson Tobacco Corporation: *See*—
Korte, Kevin R.; Litzinger, Elmer; and Wu, Dan T., 4,700,722, Cl. 131-309.000.

Browne, John F. N.: *See*—
Dakin, W. Ray; and Browne, John F. N., 4,701,603, Cl. 250-201.000.

Brownlee, Shirley G.: *See*—
Kitchens, Judith F.; Culp, Carl H., Sr.; Hyde, Raymond G.; and Brownlee, Shirley G., 4,701,125, Cl. 432-1.000.

Bruce, Kenneth E., to Honeywell Information Systems Inc. Apparatus for distortion free clearing of a display during a single frame time. 4,701,863, Cl. 364-518.000.

Bruchez, Jeffrey A., to Ferranti, plc. Semiconductor device containing bipolar transistor formed by method including three photolithographic steps. 4,700,456, Cl. 439-54.000.

Bruggemann, Ulrich, to VDO Adolf Schindling AG. Electrical testing device for a vehicle combination instrument. 4,701,867, Cl. 364-550.000.

Brunn, Horst; Schulten, Gerd-Hermann; and Fuhr, Werner, to Bayer Aktiengesellschaft. Process for the production of black pigments based on iron. 4,701,221, Cl. 106-304.000.

Brunswick Corporation: *See*—
Affinito, John, 4,701,761, Cl. 342-1.000.

Brunton Company, The: *See*—
Kramer, Melvin G.; and Iden, Marlin D., 4,700,490, Cl. 33-355.00D.
Bryan, George. Combined fishing rod and fishing line vibrator. 4,700,501, Cl. 43-19.200.
BTU Engineering Corporation: *See*—
Fisher, Daniel J., Jr., 4,701,096, Cl. 414-416.000.
Buchanan, Alan S.: *See*—
Harvey, Kaye F.; Johns, Reginald B.; Buchanan, Alan S.; and Cain, David A., 4,701,184, Cl. 44-10.00D.
Buchhave, Preben; Knuhtsen, John; and Olldag, Peder E. S., to Dantec Electronik, Medicinsk Og Videnskabeligt Maleudstyr A/S. Laser-doppler-apparatus for determining the size of moving spherical particles in a fluid flow. 4,701,051, Cl. 356-336.000.
Buck, David A.; and James, Ronald N. Power tong torque control. 4,700,787, Cl. 173-164.000.
Buderus Aktiengesellschaft: *See*—
Durth, Wilfried, 4,701,334, Cl. 426-510.000.
Buecheler, Herbert: *See*—
Kittscher, Peter; and Buecheler, Herbert, 4,700,857, Cl. 215-232.000.
Bueno, Serge; and Bourbon, Philippe, to Alcatel. Device for transmitting packets in an asynchronous time-division network, and method of encoding silences. 4,701,912, Cl. 370-94.000.
Buggert, Jerrold E.: *See*—
Andreasen, David A.; Buggert, Jerrold E.; Desai, Harshad K.; and Hussain, Zubair, 4,701,845, Cl. 364-200.000.
Bugler, Thomas W., III, to Marley Cooling Tower Company, The. Multipurpose non-clogging nozzle for water cooling towers. 4,700,893, Cl. 239-498.000.
Bull, Christopher H.: *See*—
Bagga, Madan M.; and Bull, Christopher H., 4,701,378, Cl. 428-414.000.
Bullen, Ronald S.; Mzik, Joseph; and Richard, Jean P., to Canadian Fracmaster Limited. Novel compositions suitable for treating deep wells. 4,701,270, Cl. 252-8.551.
Bunk, Klaus: *See*—
Weidenauer, Werner; Leukel, Bernd; and Bunk, Klaus, 4,700,879, Cl. 228-123.000.
Bunk, Stanley A.: *See*—
Vogt, Frederich H.; Bunk, Stanley A.; and D'Acierno, John P., 4,700,636, Cl. 110-165.00A.
Buonomo, Franco: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,701,428, Cl. 502-8.000.
Burchell, Donald J., Jr.; and Peffley, Richard D., to Dow Chemical Company, The. Polyurethane elastomers prepared from high molecular weight prepolymers. 4,701,476, Cl. 521-159.000.
Burke, David D., to Tidewater Industrial Components, Inc. Vacuum system. 4,701,192, Cl. 55-213.000.
Burkhardt, Jurgen; and Rauchberger, Werner, to Wacker-Chemie GmbH. Method for stabilizing organopolysiloxanes. 4,701,490, Cl. 524-425.000.
Burns, Steve; Hutchison, Thomas M.; and Dertian, Henry H. Variable angle steering system. 4,700,963, Cl. 280-276.000.
Burr, William E. Fault-tolerant hierarchical network. 4,701,756, Cl. 340-825.020.
Burroughs Wellcome Co.: *See*—
El-Sayad, Hassan A.; Swaringen, Roy A., Jr.; and Yeowell, David A., 4,701,460, Cl. 514-308.000.
Nichol, Charles A.; Reinhard, John F., Jr.; Smith, Gary K.; and Bigham, Eric C., 4,701,455, Cl. 514-249.000.
Burtscher, Norbert: *See*—
Deutschenbaur, Paul; Rupprecht, Hans; Burtscher, Norbert; and Nigg, Berno, 4,701,083, Cl. 408-240.000.
Busa, Denis: *See*—
Bianchi, Francois; Busa, Denis; and Fourrey, Francois, 4,700,587, Cl. 74-527.000.
Bush, Earl D., to Handy Button Machine Company. Tack button. 4,700,435, Cl. 24-94.000.
Butland, Charles L., to Print-Lock Corporation. Fingerprinting system incorporating a spray container and a portable vapor tank. 4,700,657, Cl. 118-31.500.
B.V. Optische Industrie "De Oude Delft": *See*—
Beckman, Leo H. J. F.; and Oomea, Gysbert L., 4,701,049, Cl. 356-1.000.
BVT Limited: *See*—
Beardow, Terence, 4,701,251, Cl. 204-298.000.
Byer, Robert L.: *See*—
Fan, Tso Y.; and Byer, Robert L., 4,701,928, Cl. 372-68.000.
Byrum, Baney L. Collapsible self-recovering cylinder discrete impulse motor. 4,700,540, Cl. 60-325.000.
Bystroff, Roman I.: *See*—
Pearson, Richard K.; Bystroff, Roman I.; and Miller, Dale E., 4,701,379, Cl. 428-427.000.
C-D Marketing, Ltd.: *See*—
Jacob, Keith D., 4,701,022, Cl. 350-278.000.
C.& E. Fein Gmbh & Co.: *See*—
Mezger, Dieter; Harsch, Georg; and Flachenecker, Gert, 4,700,478, Cl. 30-294.000.
Cadars, Patrick, to Societe Anonyme Francaise du Ferodo. Swirl-generating, helical agitator for heat exchanger tubes. 4,700,749, Cl. 138-38.000.
Cain, David A.: *See*—
Harvey, Kaye F.; Johns, Reginald B.; Buchanan, Alan S.; and Cain, David A., 4,701,184, Cl. 44-10.00D.
Cain, Jerry T.; Mason, James M.; and Rainey, Tommy D., to SavR Company, Inc. Protective gate. 4,701,087, Cl. 410-94.000.
Calderara, Reto: *See*—
Baumgartner, Hans-Ulrich; Calderara, Reto; and Sonderegger, Hans-Conrad, 4,701,660, Cl. 310-338.000.
California Institute of Technology: *See*—
Wang, Taylor G.; Elleman, Daniel D.; Lee, Mark C.; and Kendall, James M., Jr., 4,701,436, Cl. 502-339.000.
Callegari, Stephen R., Sr.; Harrison, Luther A.; and Salsman, Robert W., Jr., to Callegari, Stephen R., Sr. Pipe measurement, labeling and controls. 4,701,869, Cl. 364-562.000.
Cambridge Engineering, Inc.: *See*—
Searcy, James A.; Zoellner, Roger O.; and Hoffmann, Ronald C., 4,700,688, Cl. 126-299.00D.
Campagnulo, Carl J.; and Benderly, Asaf A., to United States of America, Army. Multimode flashlight. 4,701,835, Cl. 362-192.000.
Campbell, Nickie G.: *See*—
Campbell, William O.; and Campbell, Nickie G., 4,700,856, Cl. 215-11.00E.
Campbell, William O.; and Campbell, Nickie G. Baby bottle with disposable liner. 4,700,856, Cl. 215-11.00E.
Campione, Ben, to Harris Corporation. Low power sense amplifier. 4,701,644, Cl. 307-530.000.
Canadian Fracmaster Limited: *See*—
Bullen, Ronald S.; Mzik, Joseph; and Richard, Jean P., 4,701,270, Cl. 252-8.551.
Canadian Patents & Development Ltd.: *See*—
Lawrence, Andre H.; and Elias, Lorne, 4,701,306, Cl. 422-101.000.
Canevall, John. Procedure for permanently storing radioactive material. 4,701,280, Cl. 252-633.000.
Canning, Peter C.: *See*—
Roth, James A.; Canning, Peter C.; and Chiang, Yu-Wei, 4,701,323, Cl. 424-88.000.
Canon Kabushiki Kaisha: *See*—
Hiramatsu, Soichi, 4,701,593, Cl. 219-216.000.
Hirose, Ryusho, 4,701,035, Cl. 350-505.000.
Ikeda, Kunihiko, 4,701,771, Cl. 346-140.00R.
Ikeda, Toshio, 4,701,908, Cl. 370-85.000.
Inoue, Eiichi; Shimizu, Isamu; and Komatsu, Toshiyuki, 4,701,394, Cl. 430-57.000.
Ishizaki, Akira; and Arakawa, Kazuhiko, 4,701,626, Cl. 250-578.000.
Koizumi, Yuichiro; Nojima, Masaki; and Shimiya, Keiji, 4,701,622, Cl. 250-486.100.
Maeshima, Katsuyoshi, 4,701,805, Cl. 358-282.000.
Nagashima, Nao, 4,701,808, Cl. 358-287.000.
Ogino, Yoshitaka, 4,701,807, Cl. 358-284.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,701,392, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,701,393, Cl. 430-57.000.
Sakaki, Mamoru; and Arai, Ryuichi, 4,701,837, Cl. 346-135.100.
Sato, Yukio, 4,701,803, Cl. 358-260.000.
Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, 4,701,766, Cl. 346-1.100.
Takayama, Kenzo, 4,701,043, Cl. 355-3.0DD.
Tokuda, Ryuji; Harunari, Yoshihiro; and Kobe, Takashi, 4,701,048, Cl. 356-1.000.
Ueda, Sigel; Matsumoto, Kozo; Kanaiwa, Kiyoshi; and Adachi, Muneo, 4,701,746, Cl. 340-347.0DD.
Cantor, Eugene; and Farrand, Thomas A., to United Technologies Corporation. Anti-rotation feature for a turbine rotor faceplate. 4,701,105, Cl. 416-95.000.
Caracteres S.A.: *See*—
Bauer, Eric, 4,700,625, Cl. 101-93.050.
Carding Specialists Ltd: *See*—
Varga, Andre; and Cripps, Henry, 4,700,538, Cl. 57-90.000.
Cardwell Machine Company, The: *See*—
Cross, Wiley E., Jr., 4,701,256, Cl. 209-139.100.
Carl Still GmbH & Co. KG, Firma: *See*—
Lorenz, Kurt; Dungs, Horst; and Auge, Karl-Hans, 4,701,243, Cl. 201-3.000.
Carl-Zeiss-Stiftung: *See*—
Hager, Karl-Heinz; Henneberg, Peter; and Juranek, Hans-Joachim, 4,701,023, Cl. 350-321.000.
Carlson, David L., to Renco Corporation. Ultrasonic detector with integral confidence tests. 4,700,711, Cl. 128-660.000.
Carlsson, Claes-Goeran: *See*—
Inge, Claes; Lagerstedt, Torgny; Borgstroem, Leonard; Carlsson, Claes-Goeran; Naebo, Sven-Olof; Moberg, Hans; and Franzen, Peter, 4,701,158, Cl. 494-74.000.
Carlsson, H. Roger; Schwartz, Stephan; and Hallberg, Mats, to Electrocell AB. Chlorinating apparatus. 4,701,265, Cl. 210-744.000.
Carr, Keith E.: *See*—
Werner, Kurt; Malchow, Gregory L.; Carr, Keith E.; and Brenner, Robert A., 4,700,492, Cl. 34-32.000.
Carter, Alan T.; Carter, Lloyd W.; and Earl, Richard, to Carter Associates. Collapsible sidewall structure for stackable bin. 4,700,862, Cl. 220-6.000.
Carter Associates: *See*—
Carter, Alan T.; Carter, Lloyd W.; and Earl, Richard, 4,700,862, Cl. 220-6.000.
Carter, Christopher F., to Plessey Overseas Limited. Pyroelectric detectors. 4,701,619, Cl. 250-338.000.

Carter, Lloyd W.: *See*—
Carter, Alan T.; Carter, Lloyd W.; and Earl, Richard, 4,700,862, Cl. 220-6.000.

Carter, Philip S.; and Krumme, John F., to Metcal, Inc. Shielded heating element having intrinsic temperature control. 4,701,587, Cl. 219-10.750.

Case-Hoyt: *See*—
Hagler, Andrew J., 4,700,627, Cl. 101-426.000.

Casio Computer Co., Ltd.: *See*—
Minamitaka, Junichi, 4,700,605, Cl. 84-1.240.
Morikawa, Shigenori; and Sasaki, Hiroyuki, 4,700,604, Cl. 84-1.030.

Cassou, Bertrand: *See*—
Cassou, Robert; Cassou, Maurice; and Cassou, Bertrand, 4,701,164, Cl. 604-218.000.

Cassou, Maurice: *See*—
Cassou, Robert; Cassou, Maurice; and Cassou, Bertrand, 4,701,164, Cl. 604-218.000.

Cassou, Robert; Cassou, Maurice; and Cassou, Bertrand. Gynecological instruments, especially for transferring embryos. 4,701,164, Cl. 604-218.000.

Castagna, John P.; and Siegfried, Robert W., II, to Atlantic Richfield Company. Method and apparatus for measuring formation compression and shear wave velocity. 4,701,891, Cl. 367-31.000.

Castellani, Antonio: *See*—
Arduini, Carlo; Barboni, Renato; Castellani, Antonio; Ponzi, Ugo; Bielli, Paolo; and Contu, Salvatore, 4,701,765, Cl. 343-897.000.

Catalyst Technology, Inc.: *See*—
Sapoff, Paul C., 4,701,101, Cl. 414-786.000.

Caterpillar Inc.: *See*—
Bernhagen, James R.; Crabb, Elmer R.; Murphy, Marilyn S.; Roley, Daniel G.; St. Germain, Gene R.; and Tunnell, James H., 4,700,794, Cl. 180-6.440.

Catheter Technology Corp.: *See*—
Groshong, LeRoy E.; and Brawn, Ronald J., 4,701,166, Cl. 604-247.000.

Caulfield, Leonard, to Teleflex Incorporated. Linear measuring device. 4,700,485, Cl. 33-143.00L.

Cefilac: *See*—
Rogemont, Jean; and Nouvet, Andre, 4,701,234, Cl. 156-230.000.

Centre Techniques des Industries Mecaniques: *See*—
Wartelle, Claude, 4,700,747, Cl. 137-625.230.

Cetus Corporation: *See*—
Loose, Joachim, 4,700,976, Cl. 283-101.000.
Nunberg, Jack H., 4,701,416, Cl. 435-320.000.

Chadwick, Dennis, to Urban Transportation Development Corporation, Ltd. Open top draw bar arrangement having removable wedge. 4,700,854, Cl. 213-62.00R.

Chalco Engineering Corporation: *See*—
Mitchell, William D., 4,700,814, Cl. 188-67.000.

Challenger Industries, Ltd.: *See*—
Torigian, Puzant C., 4,700,727, Cl. 131-369.000.

Chambron, Edmond, to Thomson-CGR. Examination table providing linear guidance for an examination panel. 4,700,938, Cl. 269-322.000.

Champ, David M., to United Foam Plastics Corp. Packing brace with interlocking members. 4,700,832, Cl. 206-320.000.

Chan, Albert; Fitzpatrick, Mark; Goddard, Don; Bosnyak, Robert J.; and Tsui, Cyrus, to Monolithic Memories, Inc. Short detector for PROMS. 4,701,695, Cl. 324-510.000.

Chan, Paul S.: *See*—
Shimirak, Gerlad L.; Hunter, Thomas; Story, Martha F.; Halstead, W. G.; Chan, Paul S.; and Swinmurn, Christopher J., 4,701,574, Cl. 174-93.000.

Chan, W. Geoffrey; and Houminer, Yoram, to Philip Morris Incorporated. β-hydroxy-γ-ketoester flavorant-release additives. 4,701,282, Cl. 260-410.90R.

Chang, Clarence D.; and Weisz, Paul B., to Mobil Oil Corporation. Replacing boron with silicon in zeolite beta using $SiCl_4$. 4,701,313, Cl. 423-277.000.

Chang, Dane; and Treybig, Duane S., to Dow Chemical Company, The. Asphalt compositions containing anti-stripping additives prepared from amines or polyamines and aldehydes. 4,701,484, Cl. 324-59.000.

Chapman, David D.: *See*—
Bogardus, David W.; Teitzel, Robin L.; and Chapman, David D., 4,701,696, Cl. 324-73.00R.

Chapman, Robert M.: *See*—
Menchetti, Robert J.; and Chapman, Robert M., 4,700,515, Cl. 52-126.100.

Chapman, Wayne M., to Rau Fasteners Inc. Apparatus for assembling speed lacers. 4,700,449, Cl. 29-513.000.

Chardonol, Division of Freeman Corporation: *See*—
Altenberg, Milton J.; and deJong, Johannes, 4,701,477, Cl. 521-167.000.

Chastain, David M.: *See*—
Jones, Thomas M.; and Chastain, David M., 4,701,917, Cl. 371-16.000.

Cheetham, Donald O., to G&C Home & Leisure Supplies Limited. One legged stool. 4,700,914, Cl. 248-155.100.

Chekan, William J., to Kendall Company, The. Multi-dimensional applicator. 4,701,167, Cl. 604-310.000.

Chemet Corporation: *See*—
Jost, Ernest M.; and Santala, Timo J., 4,700,475, Cl. 29-874.000.

Chen, Fu, to Betz Laboratories, Inc. Water treatment polymers and methods of use thereof. 4,701,262, Cl. 210-699.000.

Cherry, Herbert J., to Lear Siegler, Inc. Liftable axle with load control. 4,700,968, Cl. 280-704.000.

Cheung, Jeffrey T., to Rockwell International Corporation. Laser assisted deposition and annealing. 4,701,592, Cl. 219-121.0LT.

Chevron Research Company: *See*—
Omid, Ahmad; and Bassi, Pawan K., 4,701,205, Cl. 71-78.000.

Chiang, Yu-Wei: *See*—
Roth, James A.; Canning, Peter C.; and Chiang, Yu-Wei, 4,701,323, Cl. 424-88.000.

Chieli, Davide, to SGS Microelettronica SpA. Monolithically integrated control circuit for the switching of transistors. 4,701,631, Cl. 307-254.000.

Chikamatsu, Masataka: *See*—
Otobe, Yutaka; Kato, Akira; and Chikamatsu, Masataka, 4,700,675, Cl. 123-339.000.

Chikamori, Sunao; and Iwata, Hideyuki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Shock absorbing apparatus for an engine. 4,700,933, Cl. 267-140.100.

Child, James R.: *See*—
Persicke, Gunter; Child, James R.; and Baker, Peter F., 4,700,815, Cl. 188-286.000.

Chiodi, Wayne R.: *See*—
Blacker, Allen P.; and Chiodi, Wayne R., 4,701,678, Cl. 315-382.000.

Chisso Corporation: *See*—
Sugimori, Shigeru; and Kojima, Tetsuhiko, 4,701,547, Cl. 560-102.000.

Chiu, Hin; and Hall, Johnce E., to Amoco Corporation. Terminator assembly for a floating structure. 4,701,076, Cl. 405-224.000.

Cho, Frederick Y.: *See*—
Richard, Fred V.; Hickernell, Fred S.; and Cho, Frederick Y., 4,701,008, Cl. 350-96.120.

Cho, Ko D.: *See*—
Jung, Il N.; Cho, Ko D.; Lim, John C.; and Yoo, Bok-Ryul, 4,701,430, Cl. 502-62.000.

Choe, Jung S.; Auvil, Steven R.; and Agrawal, Rakesh, to Air Products and Chemicals, Inc. Process for separating components of a gas stream. 4,701,187, Cl. 55-16.000.

Choi, Hong-Kyun; and Tsaur, Bor-Yeu, to Massachusetts Institute of Technology. Process for making junction field-effect transistors. 4,700,461, Cl. 437-41.000.

Choinski, Edward J., to MultiTek Corporation. Apparatus and method for temporarily sealing holes in printed circuit boards. 4,700,474, Cl. 29-846.000.

Chou, Iih-Nan, to Boston University, Trustees of. Assay for the detection of epigenetic toxic (non-genotoxic) substances. 4,701,406, Cl. 435-7.000.

Christiansen, Theron L.: *See*—
Hanson, Allan W.; and Christiansen, Theron L., 4,701,731, Cl. 333-257.000.

Chrysler Motors Corporation: *See*—
Hlavach, Mark C., 4,700,977, Cl. 293-126.000.

Chubb, Charles F.: *See*—
DiMatteo, Paul; and Chubb, Charles F., 4,700,415, Cl. 5-81.00R.

Chun, Jino, to Texas Instruments Incorporated. Low power clock generator. 4,701,633, Cl. 307-269.000.

Chun, John M.: *See*—
Martin, William J.; and Chun, John M., 4,700,429, Cl. 15-377.000.

Ciba-Geigy AG: *See*—
Rohr, Thomas-Markus; and Kuhn, Jakob, 4,701,525, Cl. 534-678.000.

Ciba-Geigy Corporation: *See*—
Bagga, Madan M.; and Bull, Christopher H., 4,701,378, Cl. 428-414.000.
Blattner, Rudolf, 4,701,281, Cl. 260-367.000.
Brady, Arthur; Kristen, Ulrich; Angerer, Hermann F.; and Regenass, Franz, 4,701,273, Cl. 252-32.500.
Topfl, Werner; and Pissiotas, Georg, 4,701,206, Cl. 71-90.000.

Cimbala, Matthew G.: *See*—
McNally, Paul F.; Allen, Spencer W.; and Cimbala, Matthew G., 4,701,839, Cl. 364-167.000.

Cinalli, James A., to North American Philips Corporation. Expandable starting aid ring for fluorescent lamp. 4,701,667, Cl. 313-594.000.

Ciniglio, Alexander J., to Dolphin Machinery Limited. Soldering apparatus. 4,700,878, Cl. 228-37.000.

Cipelletti, Alberto, to Cipelletti, Ditta Alberto. Mixing screw for ice-cream production apparatuses. 4,701,054, Cl. 366-312.000.

Cipelletti, Ditta Alberto: *See*—
Cipelletti, Alberto, 4,701,054, Cl. 366-312.000.

Circle Chemical Company, Inc.: *See*—
Duminy-Kovarik, Isabelle Y., 4,701,275, Cl. 252-62.520.

Citizen Watch Co., Ltd.: *See*—
Kamiya, Kiyoshi, 4,701,796, Cl. 358-154.000.

Citroen, Maxime H. Switch control unit for motor vehicle. 4,701,629, Cl. 307-10.00R.

Claas Ohg: *See*—
Roderfeld, Heinrich; and Dammann, Johannes, 4,700,717, Cl. 130-27.00T.

Clarion Co., Ltd.: *See*—
Amazawa, Kiyoshi; and Mori, Akira, 4,701,715, Cl. 328-165.000.

Clark, Adrian P.; and Hau, Sau F., to National Research Development Corporation. Apparatus and method for adjusting the receivers of data transmission channels. 4,701,936, Cl. 375-14.000.

Clark, Jeffrey N.: *See*—
Vashi, Dhiru B.; Clark, Jeffrey N.; and Lindo, Neil A., 4,701,447, Cl. 514-85.000.

Clark, John I.: *See*—
Stokes, John H.; Clark, John I.; Morris, James D.; and Ward, Steven M., 4,701,858, Cl. 364-483.000.
Clark, William T., III. Method for automatically indexing cast field shaping blocks to a radiation therapy treatment tray and a cooling tray for cast blocks. 4,700,451, Cl. 29-527.500.
Clayton, Gerald H., II: *See*—
Seeley, Robert L.; Barth, Joseph J.; and Clayton, Gerald H., II, 4,701,712, Cl. 324-340.000.
Clemens, Robert M.: *See*—
Durbin, James L.; and Clemens, Robert M., 4,700,623, Cl. 100-52.000.
Clerc, Jean-Frederic; and Deutsch, Jean-Claude, to Commissariat a l'Energie Atomique. Liquid crystal cell which can have a homeotropic structure with compensated birefringence of said structure. 4,701,028, Cl. 350-337.000.
Clerici, Mario: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,701,428, Cl. 502-8.000.
Cleveland Clinic Foundation, The: *See*—
Eliachar, Isaac, 4,700,700, Cl. 128-207.150.
Clyde, Inc.: *See*—
Clyde, Robert A., 4,701,848, Cl. 364-300.000.
Clyde, Robert A., to Clyde, Inc. System for effectively paralleling computer terminal devices. 4,701,848, Cl. 364-300.000.
CMI Corporation: *See*—
Trudeau, Curtis A., 4,700,804, Cl. 181-121.000.
Coassolo, Alfredo: *See*—
Venturello, Carlo; Alneri, Enzo; Coassolo, Alfredo; and D'Aloisio, Rino, 4,701,550, Cl. 560-180.000.
Cohen, Jerome. Pizza crown assembly. 4,700,843, Cl. 206-521.000.
Cohen, Modehy, to Sundstrand Corporation. Ram air turbine. 4,701,104, Cl. 416-44.000.
Cohen, Morris, to NCR Corporation. Refresh system for a page addressable memory. 4,701,843, Cl. 364-200.000.
Colbachini, Giuseppe A. Apparatus for unwrapping and removal of rubber tubes. 4,701,119, Cl. 425-436.00R.
Colgate-Palmolive Company: *See*—
Ferlauto, Robert J., Jr.; and Yuhasz, Kathleen M., 4,701,318, Cl. 424-52.000.
Collins, Arthur A., to Arthur A. Collins, Inc. Dynamically reconfigurable time-space-time digital switch and network. 4,701,907, Cl. 370-63.000.
Collins, George: *See*—
Weiselfish, Jacob; and Collins, George, 4,700,633, Cl. 104-102.000.
Coman, William E.: *See*—
Andrews, Rodney R.; Ferguson, John H.; Kaiser, Frederick A.; and Coman, William E., 4,701,068, Cl. 403-359.000.
Combustion Engineering, Inc.: *See*—
Eaton, Favre E.; Brazant, James F.; and Thornton, Lawrence E., 4,701,713, Cl. 324-442.000.
McCartney, Michael S., 4,700,637, Cl. 110-237.000.
Comm/Scope Company: *See*—
Gupta, Chakra V.; and Garrett, Brian D., 4,701,575, Cl. 174-107.000.
Commissariat a l'Energie Atomique: *See*—
Clerc, Jean-Frederic; and Deutsch, Jean-Claude, 4,701,028, Cl. 350-337.000.
Koehly, Gerard; and Madic, Charles, 4,701,308, Cl. 423-2.000.
Morey, Jean-Michel; and Paradis, Gilles, 4,701,225, Cl. 148-132.000.
Raoux, Daniel, 4,701,760, Cl. 340-993.000.
Commonwealth Scientific and Industrial Research Organization (CSIRO): *See*—
Szirmai, Stephen G.; Newman, Gerard R.; and Kelly, Philip L., 4,701,941, Cl. 378-122.000.
Compagnie Generale d'Automatisme CGA-HBS: *See*—
Courjaret, Francois; Del Fabbro, Gilbert; Devic, Jean-Noel; Divoux, Michel; Forella, Guy; Hamant, Jean-Pierre; Tubiana, Dominique; and Pavie, Claude, 4,701,094, Cl. 414-330.000.
Compagnie Generale des Etablissements Michelin: *See*—
Masclaux, Pierre, 4,700,765, Cl. 152-545.000.
Compagnie Industrielle des Telecommunications: *See*—
Jurczyszyn, Michel; and Marchand, Michel, 4,701,013, Cl. 350-96.200.
Computer Information System, Inc.: *See*—
Gruet, Victor B., 4,701,003, Cl. 439-680.000.
Cone, Richard E.; and Paugstat, John F., to NCR Corporation. Quick-cleaning, scanning/weighing apparatus. 4,700,656, Cl. 177-245.000.
Conitex, Inc.: *See*—
Martinez, Antonio, 4,700,834, Cl. 206-388.000.
Martinez, Antonio, 4,700,904, Cl. 242-18.00R.
Consiglio Nazionale Delle Richerche: *See*—
Baradel, Agostino; Guerriero, Renato; and Veronese, Giuseppe, 4,701,311, Cl. 423-87.000.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Eberhard, Gunter; and Heitzig, Jurgen, 4,700,931, Cl. 267-35.000.
Hermann, Dietmar; and Walter, Siegfried, 4,701,376, Cl. 428-358.000.
Continental-Wirt Electronics Corporation: *See*—
Worth, Sidney V., 4,701,133, Cl. 439-13.000.
Contu, Salvatore: *See*—
Arduini, Carlo; Barboni, Renato; Castellani, Antonio; Ponzi, Ugo; Bielli, Paolo; and Contu, Salvatore, 4,701,765, Cl. 343-897.000.
Cook, John E., to Bendix Engine Components Limited. Hydrocarbon flow rate regulator. 4,700,750, Cl. 138-46.000.
Cook, William H.; Deichert, William G.; Wrue, Richard J.; and Westfall, Norman R., to Bausch & Lomb Incorporated. Method of making articles of dissimilar polymer compositions. 4,701,288, Cl. 264-1.400.
Cooper, Peter J., to Cooperheat, Inc. Method of maintaining pipework and/or storage vessels at predetermined process temperature by using heat tracing tape and power control system. 4,701,598, Cl. 219-535.000.
Cooperheat, Inc.: *See*—
Cooper, Peter J., 4,701,598, Cl. 219-535.000.
Corbett, Marshall J., to Grumman Aerospace Corporation. Laser illumination system for aircraft launch and landing system. 4,700,912, Cl. 244-63.000.
Cordis Corporation: *See*—
Batina, William P.; and Gipson, Lamar H., 4,700,707, Cl. 128-419.0PT.
Corenman, James E.: *See*—
New, William, Jr.; and Corenman, James E., 4,700,708, Cl. 128-633.000.
Cornell Research Foundation, Inc.: *See*—
Kraig, Richard P., 4,700,709, Cl. 128-635.000.
Timmons, Michael B., 4,700,887, Cl. 236-49.000.
Coronel, Paul K. Coronel radiant drive systems. 4,700,589, Cl. 74-705.000.
Cory, Robert M., to General Dynamics Land Systems, Inc. Endless track and components thereof for track laying vehicle. 4,700,992, Cl. 305-51.000.
Cosatto SpA: *See*—
Zuliani, Alessandro, 4,700,423, Cl. 15-160.000.
Cosentino, Stephen J.; Rugg, James M.; and Mauntel, Richard W., to Motorola, Inc. Buried n^- channel implant for NMOS transistors. 4,701,775, Cl. 357-23.120.
Cotey, John. Filling valve for use in filling balloons. 4,701,148, Cl. 446-224.000.
Cottingham, Richard L., to Timber Textures (UK) Limited. Method of artificially ageing wood. 4,701,355, Cl. 427-317.000.
Courjaret, Francois; Del Fabbro, Gilbert; Devic, Jean-Noel; Divoux, Michel; Forella, Guy; Hamant, Jean-Pierre; Tubiana, Dominique; and Pavie, Claude, to Compagnie Generale d'Automatisme CGA-HBS. Separator for heterogenous flat objects. 4,701,094, Cl. 414-330.000.
Courtois, Peter D.; and Truitt, Robert E., to Dayton Superior Corporation. Apparatus for lifting concrete panels. 4,700,979, Cl. 294-89.000.
Cover, Craig H. Multilayered insulation batt for building structures. 4,700,521, Cl. 52-404.000.
Cox & Company, Inc.: *See*—
Ferguson, Thomas F. W., 4,701,645, Cl. 307-570.000.
Cox, David M., Jr., to Cox, David M., Jr. Meat smoker. 4,700,618, Cl. 99-339.000.
CRA Services Limited: *See*—
Harvey, Kaye F.; Johns, Reginald B.; Buchanan, Alan S.; and Cain, David A., 4,701,184, Cl. 44-10.00D.
Crabb, Elmer R.: *See*—
Bernhagen, James R.; Crabb, Elmer R.; Murphy, Marilyn S.; Roley, Daniel G.; St. Germain, Gene R.; and Tunnell, James H., 4,700,794, Cl. 180-6.440.
Craenen, Gerardus S. P. M.: *See*—
Mutsers, Stanislaus M. P.; and Craenen, Gerardus S. P. M., 4,701,353, Cl. 427-213.000.
Craig, Grantland A., to Paper Converting Machine Company. Applicator for applying two or more tapes to a moving web. 4,701,239, Cl. 156-519.000.
Craig Medical Products: *See*—
Steer, Peter L., 4,701,169, Cl. 604-344.000.
Crans, Debbie C.: *See*—
Whitesides, George M.; Crans, Debbie C.; and Kazlaukas, Romas J., 4,701,285, Cl. 260-545.00P.
Crathern Engineering Co., Inc.: *See*—
Boucher, Ronald H., 4,701,238, Cl. 156-479.000.
Cray Research, Inc.: *See*—
August, Melvin C.; Bowen, Stephen A.; and Williams, John T., 4,700,996, Cl. 439-268.000.
Cripps, Henry: *See*—
Varga, Andre; and Cripps, Henry, 4,700,538, Cl. 57-90.000.
Croce, Carlo M., to Wistar Institute, The. Detection of B-cell neoplasms. 4,701,409, Cl. 435-6.000.
Crooker, Ronald H.: *See*—
Kasevich, Raymond S.; McQueeney, James F.; and Crooker, Ronald H., 4,700,716, Cl. 128-804.000.
Cross, Stephen D., to FMC Corporation. Citrus juice extractor. 4,700,620, Cl. 99-510.000.
Cross, Wiley E., Jr., to Cardwell Machine Company, The. Recirculating pneumatic separator. 4,701,256, Cl. 209-139.100.
Crossland, William A.; Walker, Christopher J. J.; and Davey, Anthony B., to Standard Telephones and Cables Public Limited Company. Laser addressed smectic displays. 4,701,029, Cl. 350-351.000.
Croudace, Michael C.; Mendelson, Leah T.; and Holstedt, Richard A., to Union Oil Company of California. Trisubstituted-borate compounds. 4,701,274, Cl. 252-46.300.
Crowley, Dennis E.: *See*—
Nelson, Catherine E.; Crowley, Dennis E.; and Weatherford, Wayne M., 4,701,329, Cl. 426-74.000.
Crull, Russell L., to Textron Inc. Undercut sealing threaded fastener. 4,701,088, Cl. 411-369.000.

Cselt-Centro Studi e Laboratori Telecommuncazioni S.p.A.: *See*—
Arduini, Carlo; Barboni, Renato; Castellani, Antonio; Ponzi, Ugo; Bielli, Paolo; and Contu, Salvatore, 4,701,765, Cl. 343-897.000.

C^3 E M Company Ltd.: *See*—
Ferreira, Leonidas, 4,701,797, Cl. 358-186.000.

Cucchi, Giovanni. Guide for use in the feeding of metal bars to a machine tool. 4,700,593, Cl. 82-2.500.

Culp, Carl H., Sr.: *See*—
Kitchens, Judith F.; Culp, Carl H., Sr.; Hyde, Raymond G.; and Brownlee, Shirley G., 4,701,125, Cl. 432-1.000.

Cummins Engine Company, Inc.: *See*—
Samulak, Douglas J., 4,700,888, Cl. 237-2.00A.

Cunning, Joseph M., to Blue Mountain Products, Inc. Misting and watering can. 4,700,892, Cl. 239-289.000.

Curti, Ezio. Arrangement for aligning a printed circuit substrate in a printing machine. 4,700,488, Cl. 33-613.000.

Curtin, William J.; Soto, Stephen; and Krueger, Steven, to Amtel Communications, Inc. Telephone answering system with line detector. 4,701,950, Cl. 379-214.000.

Curtis, Kenneth B.: *See*—
Mills, Arthur; and Curtis, Kenneth B., 4,700,634, Cl. 108-43.000.

Cycles Peugeot: *See*—
Bianchi, Francois; Busa, Denis; and Fourrey, Francois, 4,700,587, Cl. 74-527.000.

Cyclonaire Bulk Cargo Systems, Inc.: *See*—
van Aalst, Gerhardt, 4,701,080, Cl. 406-109.000.

Czarnecki, Carl: *See*—
Wodnicki, Glen G.; and Czarnecki, Carl, 4,701,581, Cl. 200-52.00R.

Czech, Johannes: *See*—
Radermacher, Wilhelm; and Czech, Johannes, 4,701,717, Cl. 330-149.000.

D'Acierno, John P.: *See*—
Vogt, Frederich H.; Bunk, Stanley A.; and D'Acierno, John P., 4,700,636, Cl. 110-165.00A.

Daems, Edie R.: *See*—
Leenders, Luc H.; Ramon, Charles L.; and Daems, Edie R., 4,701,401, Cl. 430-257.000.

Dai-ichi Seiko Kabushiki Kaisha: *See*—
Kobayashi, Shunsuke; Matsuyama, Yoshihiko; and Koutake, Masayoshi, 4,701,024, Cl. 350-331.00R.

Daicel Chemical Industries. Ltd.: *See*—
Okitsu, Kiyoshi, 4,701,483, Cl. 523-500.000.

Daikohara, Tamotsu, to Sanden Corporation. Compressor with rotation detecting device. 4,701,109, Cl. 417-223.000.

Daimler-Benz AG: *See*—
Andres, Rudolf; Knoll, Heinz; Petri, Volker; and Pfistner, Harald, 4,700,974, Cl. 280-806.000.
Leiber, Heinz, 4,700,797, Cl. 180-197.000.

Daimler-Benz Aktiengesellschaft: *See*—
Groesch, Lothar; Netzer, Gabriel; and Kassing, Lothar, 4,701,132, Cl. 434-274.000.

Dainippon Screen Manufacturing Co., Ltd.: *See*—
Yamada, Mitsuhiko, 4,701,790, Cl. 358-75.000.

Dake, Huang: *See*—
Yuan, Ren; Xianzhi, Chen; Yuanxi, Feng; Guojiu, Li; Dake, Huang; Yongli, Zhang; and Quanzhong, Sun, 4,701,689, Cl. 322-19.000.

Dakin, W. Ray; and Browne, John F. N., to Optical Disc Corporation. Focus control system for optical information recorder or player. 4,701,603, Cl. 250-201.000.

Dakota Mfg. Co., Inc.: *See*—
Bills, Joseph W.; and Moller, William D., 4,701,098, Cl. 414-502.000.

d'Alayer de Costemor d'Arc, Stephane, to Staar S.A. Swinging record changer. 4,701,899, Cl. 369-36.000.

D'Aloisio, Rino: *See*—
Venturello, Carlo; Alneri, Enzo; Coassolo, Alfredo; and D'Aloisio, Rino, 4,701,550, Cl. 560-180.000.

Dammann, Johannes: *See*—
Roderfeld, Heinrich; and Dammann, Johannes, 4,700,717, Cl. 130-27.00T.

Dana Corporation: *See*—
Lane, Wendell C., Jr., 4,700,828, Cl. 206-223.000.

Danchulis, James E. Exercise apparatus with locking means. 4,700,942, Cl. 272-73.000.

Dantec Electronik, Medicinsk Og Videnskabeligt Maleudstyr A/S: *See*—
Buchhave, Preben; Knuhtsen, John; and Olldag, Peder E. S., 4,701,051, Cl. 356-336.000.

Darcie, Thomas E., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical local area network employing microwave modulation techniques. 4,701,904, Cl. 370-3.000.

Dart Industries, Inc.: *See*—
Grusin, Gerald M., 4,700,842, Cl. 206-508.000.

Data Card Corporation: *See*—
Beech, Brian; Rust, Jeff; Meilach, Alan; and LeVasseur, Rod, 4,701,600, Cl. 235-375.000.

Data General Corporation: *See*—
Goodman, Robert W., 4,701,865, Cl. 364-521.000.

Datta, Amitava: *See*—
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,701,356, Cl. 427-423.000.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,701,357, Cl. 427-423.000.

Daughenbaugh, Norman E., Jr., to Hercules Incorporated. Vinyl aromatic/terpene/phenol terpolymer. 4,701,517, Cl. 528-205.000.

Daunis, Eugene J.: *See*—
Frey, Emory L.; Looper, David W.; and Daunis, Eugene J., 4,700,567, Cl. 73-151.000.

Davey, Anthony B.: *See*—
Crosaland, William A.; Walker, Christopher J. J.; and Davey, Anthony B., 4,701,029, Cl. 350-351.000.

David, Lawrence D., to International Business Machines Corporation. Method of producing microsized amorphous particles of metal phosphate. 4,701,314, Cl. 423-311.000.

Davis, Charles L.: *See*—
Padgett, Lonnie W., Jr.; and Davis, Charles L., 4,700,841, Cl. 206-499.000.

Davis, Christopher L.; Davis, Karlean M.; and Marshall, Ralph C. Mandible motion apparatus. 4,700,695, Cl. 128-25.00R.

Davis, Gail F.: *See*—
Berryman, Leslie N.; Davis, Gail F.; and Horinek, Herbert J., 4,701,095, Cl. 414-332.000.

Davis, Karlean M.: *See*—
Davis, Christopher L.; Davis, Karlean M.; and Marshall, Ralph C., 4,700,695, Cl. 128-25.00R.

Davis, Lincoln R.; and Flax, Louis, to LOPAT Faterprises, Inc. Collapsible, portable tote-table. 4,700,986, Cl. 297-157.000.

Davis, Walter L.; and Parikh, Dakshesh D., to Motorola, Inc. Paging system using LPC speech encoding with an adaptive bit rate. 4,701,943, Cl. 379-57.000.

Dayton Superior Corporation: *See*—
Courtois, Peter D.; and Truitt, Robert E., 4,700,979, Cl. 294-89.000.

Dean, Arthur L.; Kraft, Robert E.; and Marshall, Kenneth M., to FMC Corporation. Electromagnetic vibratory exciter. 4,701,647, Cl. 310-29.000.

Dean, Barry D., to Atlantic Richfield Company. Acrylic modified N-arylmaleimide copolymer molding composition. 4,701,493, Cl. 524-504.000.

Decaudin, Robert; Gurtner, Bernard; and Gagnieur, Andre, to Atochem. Process for the preparation of brominated derivatives of diphenyl ether. 4,701,564, Cl. 568-639.000.

Deckman, Harry W.; Stephens, Richard B.; Tiedje, J. Thomas; and Abeles, Benjamin, to Exxon Research and Engineering Company. Micro-porous superlattice material having zeolite-like properties. 4,701,366, Cl. 428-188.000.

DeCristofaro, Nicholas J.: *See*—
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,701,356, Cl. 427-423.000.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,701,357, Cl. 427-423.000.

Deere & Company: *See*—
Bartusek, Robert J.; Steilen, Ronald M.; and Rettig, Vernon E., 4,700,785, Cl. 172-705.000.
Emmert, Walter, 4,700,537, Cl. 56-314.000.
Head, Glenn D., Jr.; and Postal, Jeffrey J., 4,700,641, Cl. 111-85.000.
Reilly, Roger D., 4,700,534, Cl. 56-13.300.

deFasselle, Robert J.: *See*—
Barrett, John P.; Schulz, Daniel R.; Kent, David E.; deFasselle, Robert J.; and Zega, Henry E., 4,700,884, Cl. 236-12.120.

DeHaitre, Lon, to Abbott Interfast Corp. Reusable syringes. 4,701,165, Cl. 604-228.000.

Deichert, William G.: *See*—
Cook, William H.; Deichert, William G.; Wrue, Richard J.; and Westfall, Norman R., 4,701,288, Cl. 264-1.400.

Deimen, James M.: *See*—
Thomas, Harold F.; and Deimen, James M., 4,700,961, Cl. 280-152.00A.

deJong, Johannes: *See*—
Altenberg, Milton J.; and deJong, Johannes, 4,701,477, Cl. 521-167.000.

Delany, John J., to Research Products Corporation. Air filter assembly. 4,701,196, Cl. 55-481.000.

de Lassat de Pressigny, Yann; and Schneider, Michel, to Institut de Recherches de la Sidergie Francaise Irsid. Device for injecting pulverulent material, such as coal, in a blast furnace. 4,700,930, Cl. 266-267.000.

Del Fabbro, Gilbert: *See*—
Courjaret, Francois; Del Fabbro, Gilbert; Devic, Jean-Noel; Divoux, Michel; Forella, Guy; Hamant, Jean-Pierre; Tubiana, Dominique; and Pavie, Claude, 4,701,094, Cl. 414-330.000.

De Lott, Stuart C., to Wingspread Corporation. Convertible garment. 4,700,409, Cl. 2-94.000.

Delpuech, Alain G. M.: *See*—
Ohmer, Herve; and Delpuech, Alain G. M., 4,701,890, Cl. 367-25.000.

DeLuca, Michael A.; and McCormack, John F., to Kollmorgen Corporation. Surface preparation of ceramic substrates for metallization. 4,701,352, Cl. 427-98.000.

Del Vento, Maria. Salad dressing and method of making. 4,701,338, Cl. 426-602.000.

Demerson, Christopher A.: *See*—
Mobilio, Dominick; Demerson, Christopher A.; and Humber, Leslie G., 4,701,533, Cl. 548-439.000.

De Mol, Dirk; and Shaw, Graham, to Measurex Corporation. System and process for controlling the shape of a strip of metal. 4,700,557, Cl. 72-12.000.

Demoute, Jean-Pierre: *See*—
Tessier, Jean; and Demoute, Jean-Pierre, 4,701,542, Cl. 549-456.000.

Dendro Maskin DM AB: *See*—
Norberg, Helmer L., 4,700,530, Cl. 53-410.000.

den Hollander, Willem; and Leonardi, Giovanni M., to RCA Corporation. Television display system with flicker reduction processor. 4,701,793, Cl. 358-140.000.

Denning Mobile Robotics, Inc.: *See*—
Muller, Lon J.; Franklin, Austin; and George, Robert W., II, 4,701,893, Cl. 367-87.000.

D'Entremont, John R.: *See*—
Beggs, Louis C.; and D'Entremont, John R., 4,701,824, Cl. 361-24.000.

Denz, Helmut, to Robert Bosch GmbH. Method of controlling the operating characteristic quantities of an internal combustion engine. 4,700,673, Cl. 123-325.000.

de Rooij, Johannes F.: *See*—
Doornbos, Tamme; van der Heijden, Arnoldus; van der Kamp, Johannes W.; and de Rooij, Johannes F., 4,701,335, Cl. 426-533.000.

DeRoss, Robert, to Molex Incorporated. Electrical connector for coaxial cables. 4,701,137, Cl. 439-394.000.

Dertian, Henry H.: *See*—
Burns, Steve; Hutchison, Thomas M.; and Dertian, Henry H., 4,700,963, Cl. 280-276.000.

Dervan, Andrew H.: *See*—
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,701,501, Cl. 525-449.000.
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,701,502, Cl. 525-449.000.

Desai, Harshad K.: *See*—
Andreasen, David A.; Buggert, Jerrold E.; Desai, Harshad K.; and Hussain, Zubair, 4,701,845, Cl. 364-200.000.

DesBois, Michel; and Amiet, Louis, to Rhone-Poulenc Specialites Chimiques. Process for preparing trifluoroacetic or trichloroacetic acid esters. 4,701,551, Cl. 560-226.000.

Desfontaines, Guy: *See*—
Alibran, Patrice; Millot, Jean-Paul; and Desfontaines, Guy, 4,701,299, Cl. 376-302.000.
Millot, Jean-Paul; Alibran, Patrice; and Desfontaines, Guy, 4,701,296, Cl. 376-172.000.

Desjardins, Francois G., to Electrohome Limited. Color temperature correction of color video projectors. 4,701,788, Cl. 358-64.000.

Deutsch, Jean-Claude: *See*—
Clerc, Jean-Frederic; and Deutsch, Jean-Claude, 4,701,028, Cl. 350-337.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Pabsch, Arno R. E. K., 4,700,647, Cl. 114-39.000.

Deutschenbaur, Paul; Rupprecht, Hans; Burtscher, Norbert; and Nigg, Berno, to Hilti Aktiengesellschaft. Tool holder for drilling and chiselling tools. 4,701,083, Cl. 408-240.000.

Devic, Jean-Noel: *See*—
Courjaret, Francois; Del Fabbro, Gilbert; Devic, Jean-Noel; Divoux, Michel; Forella, Guy; Hamant, Jean-Pierre; Tubiana, Dominique; and Pavie, Claude, 4,701,094, Cl. 414-330.000.

DeVilbiss, Warren C., to RCA Corporation. Method and apparatus for compacting and de-compacting text characters. 4,701,744, Cl. 340-347.0DD.

Devine, Thomas M., Jr., to General Electric Company. Composite rotary anode for X-ray tube and process for preparing the composite. 4,700,882, Cl. 228-194.000.

Dewald, Horace A.; Wise, Lawrence D.; and Heffner, Thomas G., to Warner-Lambert Company. Aminoalkoxybenzopyranones as antipsychotic and anxiolytic agents. 4,701,456, Cl. 514-253.000.

DeWitt, Glen A., III. Breakaway surfboard fin holder. 4,701,144, Cl. 441-79.000.

Dianon Systems, Inc.: *See*—
Katopodis, Nonda, 4,701,418, Cl. 436-64.000.

Dicke, Hans-Rudolf; Bottenbruch, Ludwig; Wedemeyer, Karlfried; Paetz, Klaus-Christian; and El Sayed, Aziz, to Bayer Aktiengesellschaft. Thermotropic aromatic polyester from 3,3'-diphenyl-4,4'-dihydroxy biphenyl and arylene dicarboxylic acid. 4,701,515, Cl. 528-176.000.

Dickie, Robert G.: *See*—
Hobbins, Martin E.; Dickie, Robert G.; and Pardo, Rene, 4,701,801, Cl. 353-245.000.

Dickinson, W. David; and Baetz, Charles N., to American Sigma, Inc. Two stage pump sampler. 4,701,107, Cl. 417-86.000.

Dickneite, Gerhard: *See*—
Limbert, Michael; Durckheimer, Walter; Schorlemmer, Hans-Ulrich; and Dickneite, Gerhard, 4,701,452, Cl. 514-206.000.

Diesel Kiki Co., Ltd.: *See*—
Iijima, Takeo, 4,701,110, Cl. 417-269.000.

Dietsche, Thomas J.: *See*—
Humphreys, Paula L.; Dietsche, Thomas J.; and Bixby, James L., 4,701,532, Cl. 546-345.000.

Digital Equipment Corporation: *See*—
Goodrich, Gerald O.; Tehranian, Michael M.; and White, Donald A., 4,701,841, Cl. 364-200.000.

DiGiulio, Peter C.; Hafner, Warren G.; and Stalzer, Henry, to Pitney Bowes Inc. Reset delay circuit for an electronic postage meter. 4,701,856, Cl. 364-466.000.

Dillman, John S. Adjustable load binding hook. 4,700,917, Cl. 248-228.000.

DiMatteo, Paul; and Chubb, Charles F., to Nova Technologies, Inc. Reclinable wheelchair apparatus. 4,700,415, Cl. 5-81.00R.

Director-General of Agency of Industrial Science and Technology: *See*—
Arakawa, Tatsumi; Ozaki, Masaru; and Ikeda, Yukihiro, 4,701,317, Cl. 423-445.000.

Dirkin, William, to Pneumo Abex Corporation. Composite pressure vessel including fluid port with replaceable seal in composite sidewall structure and method of constructing such fluid port. 4,700,868, Cl. 220-465.000.

Discovision Associates: *See*—
Giddings, Gary M., 4,701,898, Cl. 369-32.000.

Disdier, Camille: *See*—
Regimbeau, Guy; Augelmann, Gerard; and Disdier, Camille, 4,701,560, Cl. 564-404.000.

Disney, Daniel J.: *See*—
Thompson, Richard F.; Disney, Daniel J.; Quek, Swee-meng; and Westerfeld, Eric C., 4,701,844, Cl. 364-200.000.

Dive N'Surf, Inc.: *See*—
Meistrell, William R., 4,700,406, Cl. 2-22.000.

Divoux, Michel: *See*—
Courjaret, Francois; Del Fabbro, Gilbert; Devic, Jean-Noel; Divoux, Michel; Forella, Guy; Hamant, Jean-Pierre; Tubiana, Dominique; and Pavie, Claude, 4,701,094, Cl. 414-330.000.

Dix, Joseph: *See*—
Pettinga, Robert; Dix, Joseph; McHugh, Thomas O.; Sibley, Lincoln L., Jr.; Ziemba, Richard T.; and Forrester, Victor J., 4,700,608, Cl. 89-11.000.

Dixon, Thomas J.; and Uchtman, Vernon A., to Procter & Gamble Company, The. Conditioning shampoo. 4,701,322, Cl. 424-70.000.

Dockus, Kostas F.; and Zambrow, John L., to Borg-Warner Corporation. Controlled atmosphere capsule for fluxless brazing. 4,701,127, Cl. 432-242.000.

Dr. Ing. H.c.f. Porsche AG: *See*—
Hickmann, Udo; and Ruehle, Guenter, 4,700,820, Cl. 192-48.500.
Morlok, Albrecht; and Weigele, Hans, 4,700,796, Cl. 180-88.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Ruehr, Volker, 4,701,742, Cl. 340-58.000.

Dr. Johannes Heidenhain GmbH: *See*—
Kraus, Heinz, 4,700,482, Cl. 33-1.0PT.

Dodds, Ralph G.; and Ryan, Patrick B., to Luc Technologies Limited. Bonding machine having rotating fictional tools and work clamping means. 4,700,877, Cl. 228-2.000.

Doi, Muneharu: *See*—
Miyagawa, Kenichiro; Doi, Muneharu; and Akiyama, Shun-ichi, 4,701,413, Cl. 435-88.000.

Doi, Shunichi; Sugiura, Noboru; Hayashi, Yasutaka; and Yamamoto, Yuzo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Adjustable hydropneumatic active suspension apparatus. 4,700,971, Cl. 280-707.000.

Dolby, Ray M. Circuit arrangements for modifying dynamic range using series and parallel circuit techniques. 4,701,722, Cl. 333-14.000.

Dolny, Gary M.; and Goodman, Lawrence A., to RCA Corporation. Method for fabricating bidirectional vertical power MOS device. 4,700,460, Cl. 437-81.000.

Dolphin Machinery Limited: *See*—
Ciniglio, Alexander J., 4,700,878, Cl. 228-37.000.

Dommer, Erich; Rechtziegel, Bruno; and Tauber, Klaus, to Berkenhoff GmbH. Filler metal for welding. 4,701,302, Cl. 420-470.000.

Domnick Hunter Filters Limited: *See*—
Billiet, Colin T.; and Baggett, David, 4,701,258, Cl. 210-232.000.

Donaldson, Richard E.; and Hoops, John F., to Merrell Dow Pharmaceuticals Inc. Medroxalol intermediates. 4,701,541, Cl. 549-440.000.

Donnelly Corporation: *See*—
Nieboer, Keith A.; and Tucker, Herbert D., 4,700,525, Cl. 52-698.000.

Donzelli, Giampiero, to Telettra-Telefonia Elettronica e Radio, S.p.A. Process for grounding flat devices and integrated circuits. 4,700,467, Cl. 437-209.000.

Doornbos, Tamme; van der Heijden, Arnoldus; van der Kamp, Johannes W.; and de Rooij, Johannes F., to Lever Brothers Company. Butter-like concentrate. 4,701,335, Cl. 426-533.000.

Dorina Nahmaschinen GmbH: *See*—
Kefer, Joseph; and Ruf, Gerhard, 4,700,645, Cl. 112-259.000.

Dorinski, Dale: *See*—
Freyman, Bruce J.; Dorinski, Dale; and Shurboff, John, 4,700,473, Cl. 29-846.000.

Dornier GmbH: *See*—
Eibert, Max; Lux, Peter; and Metzdorf, Walter, 4,701,047, Cl. 356-1.000.
Zimmer, Herbert, 4,700,911, Cl. 244-35.00R.

Dorr-Oliver Incorporated: *See*—
Vogt, Frederich H.; Bunk, Stanley A.; and D'Acierno, John P., 4,700,636, Cl. 110-165.00A.

Dorsey, Denis P., to RCA Corporation. Radio frequency signal coupler. 4,701,725, Cl. 333-185.000.

Dorst Maschinen- und Analagenbau, Otto Dorst und Dipl.-Ing. Walter Schlegel GmbH & Co.: *See*—
Reimche, Heinrich, 4,701,122, Cl. 425-584.000.

Dougherty, Steven J. Apparatus for measuring entrained gas-phase content in a liquid. 4,700,561, Cl. 73-19.000.

Dover Resources, Inc.: *See*—
Frese, John J.; and Kroll, Quin D., 4,700,738, Cl. 137-412.000.

Dow Chemical Company, The: *See*—
Adaway, Timothy J., 4,701,531, Cl. 546-297.000.
Behr, Raymond D.; and Zieke, Larry M., 4,701,358, Cl. 428-35.000.
Bogan, Gary W.; Lucas, Peter A.; and Monnerat, Georgia A., 4,701,481, Cl. 523-428.000.

Burchell, Donald J., Jr.; and Peffley, Richard D., 4,701,476, Cl. 521-159.000.
Chang, Dane; and Treybig, Duane S., 4,701,484, Cl. 524-59.000.
Dunbar, Joseph E.; Holmsen, Theodore W.; and Senkbeil, Herman O., 4,701,211, Cl. 71-121.000.
Hefner, Robert E., Jr., 4,701,257, Cl. 209-166.000.
Humphreys, Paula L.; Dietsche, Thomas J.; and Bixby, James L., 4,701,532, Cl. 546-345.000.
Irving, Nicholas M., 4,701,520, Cl. 528-412.000.
Kalnins, John M.; McIntyre, James A.; Moyer, John R.; Phillips, Robert F.; and Snoble, Karel A. J., 4,701,247, Cl. 204-131.000.
Mullins, Michael J., 4,701,549, Cl. 560-159.000.
Parker, Theodore L., 4,701,512, Cl. 528-45.000.
Rogers, Richard B.; and Herrero, Maria P., 4,701,207, Cl. 71-92.000.
Rogers, Richard B.; and Herrero, Maria P., 4,701,463, Cl. 514-333.000.
Swearingen, Loren L.; Embrey, Wallace E.; LaTulip, Randy J.; Earls, Jim D.; and McConchie, Garnet E., 4,701,529, Cl. 546-251.000.
Swearingen, Loren L.; and LaTulip, Randy J., 4,701,530, Cl. 546-251.000.
Turner, Robert B., 4,701,475, Cl. 521-137.000.

Dow Corning Corporation: *See*—
Kookootsedes, Gust J.; Reese, Herschel H.; Gutek, Beth I.; and Pretzer, Gale H., 4,701,017, Cl. 350-96.340.
Lamont, Peter; Monroe, Carl M.; and Skostins, Olgerts, 4,701,491, Cl. 524-493.000.
Liles, Donald T.; and Speier, John L., 4,701,289, Cl. 264-8.000.
Narula, Dipak; Be, Anh; and Zemanek, Charles P., 4,701,380, Cl. 428-447.000.

DOX-AL Italia SpA: *See*—
Grabitz, Ernst B., 4,701,331, Cl. 426-302.000.

Drake, Evelyn N.: *See*—
Duvdevani, Ilan; Manalastas, Pacifico V.; Drake, Evelyn N.; and Thaler, Warren A., 4,701,204, Cl. 71-28.000.

Dresser Industries, Inc.: *See*—
Read, Norman W., 4,700,782, Cl. 166-330.000.

Drews, Reinhold A.; Jautakis, Karl; and Kuyper, Mark E., to Whirlpool Corporation. Heater assembly and mounting arrangement for a dryer. 4,700,495, Cl. 34-133.000.

Drexler Technology Corporation: *See*—
Haddock, Richard, 4,700,840, Cl. 206-449.000.

Du Pont Canada Inc.: *See*—
Mitchell, David J.; and Zboril, Vaclav G., 4,701,504, Cl. 526-83.000.

Duben, Jiri: *See*—
Kaspers, Helmut; Duben, Jiri; and Gisi, Ulrich, 4,701,454, Cl. 514-245.000.

Dudzik, Henryk, to R. W. Simon Limited. Strip ventilator. 4,700,614, Cl. 98-98.000.

Duerr, Dennis. Wood splitter. 4,700,759, Cl. 144-193.00A.

Duke, Martin G.: *See*—
Horsewell, Henry G.; and Duke, Martin G., 4,700,724, Cl. 131-336.000.

Duminy-Kovarik, Isabelle Y., to Circle Chemical Company, Inc. Testing system. 4,701,275, Cl. 252-62.520.

Dumoulin, Charles L.: *See*—
Hardy, Christopher J.; and Dumoulin, Charles L., 4,701,708, Cl. 324-311.000.

Dunbar, Joseph E.; Holmsen, Theodore W.; and Senkbeil, Herman O., to Dow Chemical Company, The. Substituted benzyltriethylammonium salts and their use as plant growth enhancers. 4,701,211, Cl. 71-121.000.

Duncan, Gary L., to Mobil Oil Corporation. Opaque polymer film laminate having an absorbent surface. 4,701,369, Cl. 428-313.900.

Dungs, Horst: *See*—
Lorenz, Kurt; Dungs, Horst; and Auge, Karl-Hans, 4,701,243, Cl. 201-3.000.

Dunkerton, Stephen H.; Erickson, Gary D.; and Reynolds, Gary R., to Motorola, Inc. Individual simulcast transmitter remote control system encoder. 4,701,758, Cl. 340-825.480.

Dunn, Larry W. Air compressor. 4,700,663, Cl. 123-1.00R.

Du Pont de Nemours, E. I., and Company: *See*—
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,701,501, Cl. 525-449.000.
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,701,502, Cl. 525-449.000.
Levitt, George, 4,701,535, Cl. 549-60.000.
Miller, Conrad E., 4,701,403, Cl. 430-529.000.
Mouissie, Bob, 4,701,002, Cl. 439-426.000.
Potter, Raymond G., 4,701,157, Cl. 494-16.000.
Verhoeven, Laurentius M., 4,701,001, Cl. 439-394.000.
Wheeler, James W., 4,701,398, Cl. 430-510.000.

Duport, Louis. Double-action belt intended particularly for a speed varying device comprising pulleys of variable useful diameter. 4,701,153, Cl. 474-201.000.

Durbin, James L.; and Clemens, Robert M., to A.K.G.S. Partnership, A Partnership of Las Vegas. Aircraft trash compactor. 4,700,623, Cl. 100-52.000.

Durbin, John A.: *See*—
Harrigan, Michael E.; Durbin, John A.; and Schroll, Ross E., 4,701,027, Cl. 350-334.000.

Durckheimer, Walter: *See*—
Limbert, Michael; Durckheimer, Walter; Schorlemmer, Hans-Ulrich; and Dickneite, Gerhard, 4,701,452, Cl. 514-206.000.

Duriron Company, Inc., The: *See*—
Wissman, Jack L., 4,701,291, Cl. 264-248.000.

Durth, Wilfried, to Buderus Aktiengesellschaft. Method of selectively operating a cooking apparatus with circulating heated air or water vapor. 4,701,334, Cl. 426-510.000.

Dutil, Robert; and Gilbert, Raymond. Automatic transmission for multi-speed bicycle. 4,701,152, Cl. 474-70.000.

Dutt, Herbert V.; and Weir, Dixie L., to Sun Coast Plastics, Inc. Sleeved container and closure assembly. 4,700,867, Cl. 220-410.000.

Dutton, Edmund L.; Selfridge, Glenn D.; and Tipton, Russell C., to Mallinckrodt, Inc. Controlled atmosphere enclosure. 4,701,415, Cl. 435-289.000.

Duvdevani, Ilan; Manalastas, Pacifico V.; Drake, Evelyn N.; and Thaler, Warren A., to Exxon Research and Engineering Company. Composite comprising a substrate coated with polymeric complexes. 4,701,204, Cl. 71-28.000.

Duvdevani, Ilan: *See*—
Mintz, Donald J.; Peiffer, Dennis G.; Thaler, Warren A.; and Duvdevani, Ilan, 4,701,263, Cl. 210-728.000.

Duvent, Jean-Louis, to U.S. Philips Corporation. Method of automatic focussing by digital analysis of the contours of an image. 4,701,782, Cl. 358-227.000.

Earl, Richard: *See*—
Carter, Alan T.; Carter, Lloyd W.; and Earl, Richard, 4,700,862, Cl. 220-6.000.

Earls, Jim D.: *See*—
Swearingen, Loren L.; Embrey, Wallace E.; LaTulip, Randy J.; Earls, Jim D.; and McConchie, Garnet E., 4,701,529, Cl. 546-251.000.

Easter, Michael D. Storage reel with self-adjusting hub for precoiled goods. 4,700,908, Cl. 242-86.400.

Eastman Kodak Company: *See*—
Alexandrovich, Peter S.; Santilli, Domenic; and Ng, Yee S., 4,701,387, Cl. 430-45.000.
Hung, Yann; Klose, Thomas R.; Regan, Michael T.; and Rossi, Louis J., 4,701,396, Cl. 430-58.000.
McClure, Richard J., 4,701,820, Cl. 360-125.000.
Thunberg, Allen L.; and Reczek, James A., 4,701,420, Cl. 436-94.000.
Weaver, Max A.; Moore, William H.; and Lum, Kin K., 4,701,439, Cl. 503-227.000.
Wu, Tai-Wing, 4,701,411, Cl. 435-25.000.

Eaton Corporation: *See*—
Keranen, John J.; Peret, Scot F.; and Stewart, David R., 4,701,578, Cl. 200-5.00B.
Winckler, Peter S., 4,700,823, Cl. 192-107.00M.

Eaton, Favre E.; Brazant, James F.; and Thornton, Lawrence E., to Combustion Engineering, Inc. Oil and fuel comtamination monitoring system. 4,701,713, Cl. 324-442.000.

Eberhard, Gunter; and Heitzig, Jurgen, to Continental Gummi-Werke Aktiengesellschaft. Resilient mounting. 4,700,931, Cl. 267-35.000.

Eckel, Robert: *See*—
Larue, Roderick W.; Aebersold, Werner; and Eckel, Robert, 4,701,664, Cl. 313-112.000.

Eckert, Guenter: *See*—
Bay, Herbert; Widder, Rudi; and Eckert, Guenter, 4,701,269, Cl. 252-8.570.

Eckstein, Gunter K., to Shell Oil Company. Process for separating fly-ash. 4,701,185, Cl. 48-197.00R.

Edwards, Robert C., to Amoco Corporation. Process for improving phosphorus-vanadium oxide and phosphorus-vanadium-co-metal oxide catalysts. 4,701,433, Cl. 502-209.000.

Egan, Joseph W.: *See*—
McGhee, James B.; Egan, Joseph W.; and Hill, Leslie C., 4,700,886, Cl. 236-25.00R.

Egbers, Gerhard: *See*—
Artzt, Peter; Muller, Heinz; Ziegler, Kurt; Egbers, Gerhard; and Wokaun, Jacek, 4,700,431, Cl. 19-105.000.

Eguchi, Isamu: *See*—
Mitsukuchi, Kunio; Ito, Hiromitsu; Eguchi, Isamu; Hirasato, Bunji; and Furuhata, Takashi, 4,701,583, Cl. 200-148.00B.

Eguchi, Tohru: *See*—
Hasegawa, Kenji; Nakashima, Koichi; Eguchi, Tohru; and Ota, Masako, 4,701,320, Cl. 424-54.000.

Eguchi, Yasukata; Hanyu, Susumu; Hara, Kazumasa; and Koike, Mikio, to Janome Sewing Machine Co. Ltd. Sewing machine having an automatic lower thread tension device. 4,700,644, Cl. 112-255.000.

Ehemann, Gero; and Mainz, Klaus. Ski pole and snow support element for a ski pole. 4,700,975, Cl. 280-824.000.

Eibert, Max; Lux, Peter; and Metzdorf, Walter, to Dornier GmbH. Line selection for preparing range images. 4,701,047, Cl. 356-1.000.

Eichman, Carl E.; Gurubatham, Vincent P.; Hauch, Dennis W.; and Kinyon, Garrett K., to Whirlpool Corporation. Detergent dispenser with improved water distribution means. 4,700,554, Cl. 68-17.00R.

Eickmann, Karl. Pump arrangement which includes a working chamber which is bordered by a coned ring with a seal lip on the inner face of the coned ring. 4,701,113, Cl. 417-472.000.

Eiermann, Dankwart: *See*—
Mitsumoto, Takashi; Eiermann, Dankwart; and Nuber, Roland, 4,700,740, Cl. 137-512.150.

Eikonix Corporation: *See*—
Barrett, Douglas J., 4,701,809, Cl. 358-293.000.

Einhaus, Hermanus F., to U.S. Philips Corporation. Automatic record player pick-up arm control device having minimal height. 4,701,903, Cl. 369-216.000.

Eisen, Leonard, to Allen Classics, Ltd. Console-housed tray table set. 4,700,635, Cl. 108-91.000.

Eisenhut, Wolfgang O.; and Senf, John W., to Adhesive Engineering Company. Pumping system. 4,701,112, Cl. 417-345.000.

El Paso Products Company: *See*—
Hughes, Michael P.; and Pellon, Brian J., 4,701,489, Cl. 524-349.000.

Elden, Michael G. System for summoning service personnel and monitoring their response time. 4,701,849, Cl. 364-401.000.

Electrocell AB: *See*—
Carlsson, H. Roger; Schwartz, Stephan; and Hallberg, Mats, 4,701,265, Cl. 210-744.000.

Electrohome Limited: *See*—
Desjardins, Francois G., 4,701,788, Cl. 358-64.000.

Elger, John H., to Sunbeam Corporation. Juice extractor quick connect/disconnect coupling. 4,700,621, Cl. 99-511.000.

El-Hag, Nabil A.: *See*—
Rogers, Ann M.; El-Hag, Nabil A.; and Shenouda, Soliman Y. K., 4,701,330, Cl. 426-270.000.

El-Hanany, Uri; Lachish, Uri; Rotter, Shlomo; and Adler, Eli, to Arel Control Systems, Ltd.; and State of Israel. Temperature control laser detection apparatus. 4,701,607, Cl. 250-205.000.

Eliachar, Isaac, to Cleveland Clinic Foundation, The. Endotracheal tube. 4,700,700, Cl. 128-207.150.

Elias, Bernard: *See*—
Galles, Henri; and Elias, Bernard, 4,700,864, Cl. 220-86.00R.

Elias, Lorne: *See*—
Lawrence, Andre H.; and Elias, Lorne, 4,701,306, Cl. 422-101.000.

Elleman, Daniel D.: *See*—
Wang, Taylor G.; Elleman, Daniel D.; Lee, Mark C.; and Kendall, James M., Jr., 4,701,436, Cl. 502-339.000.

Elliott, George D. Fuel injector. 4,700,678, Cl. 123-297.000.

Elliott, Kenneth R., to Rockwell International Corporation. Method of adjusting threshold voltage subsequent to fabrication of transistor. 4,701,422, Cl. 437-8.000.

Ellis, Darwin L., to Aluminum Company of America. Valve. 4,700,745, Cl. 137-625.110.

Ellis, Louise C.; Fahrenkrug, Anne M.; Basten, Julie T.; and Milner, James D., to Kimberly-Clark Corporation. Three-dimensional shaped feminine pad with narrow, absorbent center and winged edges. 4,701,177, Cl. 604-385.00A.

Ellwood, Derek C.: *See*—
Gibbs, Dudley F.; Greenhalgh, Marilyn E.; Watson, James H. P.; Yeo, Richard G.; and Ellwood, Derek C., 4,701,261, Cl. 210-606.000.

Elmar Industries, Inc.: *See*—
Minard, Everett S., 4,700,756, Cl. 141-144.000.

Elmec Corporation: *See*—
Kameya, Kazuo, 4,701,723, Cl. 333-33.000.

Elms, Robert T.: *See*—
Lagree, James L.; and Elms, Robert T., 4,701,673, Cl. 315-244.000.

Elpatronic AG: *See*—
Kramer, Felix, 4,700,865, Cl. 220-274.000.

El-Sayad, Hassan A.; Swaringen, Roy A., Jr.; and Yeowell, David A., to Burroughs Wellcome Co. Long duration neuromuscular blocking agents. 4,701,460, Cl. 514-308.000.

El Sayed, Aziz: *See*—
Dicke, Hans-Rudolf; Bottenbruch, Ludwig; Wedemeyer, Karl-fried; Paetz, Klaus-Christian; and El Sayed, Aziz, 4,701,515, Cl. 528-176.000.

Elsner Engineering Works, Inc.: *See*—
Bargholtz, William E.; and Molison, Robert E., 4,700,529, Cl. 53-399.000.

ELTECH Systems Corporation: *See*—
Fenn, Robert W., III; Pless, Emory J.; Harris, Richard L.; and O'Leary, Kevin, 4,701,250, Cl. 204-283.000.

Embrey, Wallace E.: *See*—
Swearingen, Loren L.; Embrey, Wallace E.; LaTulip, Randy J.; Earls, Jim D.; and McConchie, Garnet E., 4,701,529, Cl. 546-251.000.

Emhart Industries, Inc.: *See*—
Foster, Thomas V., 4,701,202, Cl. 65-265.000.

Emkey, William L.; and Jack, Curtis A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Multimode fiber-lens optical coupler. 4,701,011, Cl. 350-96.180.

Emmert, Walter, to Deere & Company. Crop divider mounting arrangement for a harvester. 4,700,537, Cl. 56-314.000.

Empire of Carolina, Inc.: *See*—
Kinberg, Benjamin, 4,700,965, Cl. 280-289.00D.

Enda, Masami: *See*—
Fujita, Reiko; and Enda, Masami, 4,701,246, Cl. 204-130.000.

Endo, Akira; and Yamashita, Haruyuki, to Asahi Denka Kogyo Kabushiki Kaisha. Metal salt of organic phosphate and an antihyperlipemic agent containing the same. 4,701,448, Cl. 514-121.000.

Endo, Kazuyuki; Taniguchi, Motoaki; Takahashi, Masanobu; Yamada, Shigeki; and Kato, Kenshiro, to Bridgestone Corporation. Heavy duty pneumatic radial tires. 4,700,764, Cl. 152-526.000.

Endo, Shyusuke; Aoyama, Naofumi; Yabuuchi, Toshihiko; Sakuma, Toshiyuki; and Kinugawa, Kiyoshige, to Hitachi, Ltd. Liquid crystal display device with driving method to eliminate blur due to frequency dependence. 4,701,025, Cl. 350-333.000.

Endress u. Hauser GmbH u. Co.: *See*—
Michalski, Bernhard; Lau, Jurgen; and Berger, Wolfram, 4,700,569, Cl. 73-290.00V.

Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; Allred, David D.; Walter, Lee; and Hudgens, Stephen J., 4,701,343, Cl. 427-39.000.

Energy Optics Inc.: *See*—
Stokes, John H.; Clark, John I.; Morris, James D.; and Ward, Steven M., 4,701,858, Cl. 364-483.000.

Engel, John F.: *See*—
Phillips, Richard B.; Plummer, Ernest L.; and Engel, John F., 4,701,464, Cl. 514-345.000.

Enichem Sintesi S.p.A.: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,701,428, Cl. 502-8.000.

Eniricerche S.p.A.: *See*—
Roggero, Arnaldo; and Gandini, Alberto, 4,701,498, Cl. 525-293.000.

Entenmann, Robert: *See*—
Bonitz, Jorg; Entenmann, Robert; Miller, Bernhard; Rauch, Hans; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, 4,700,677, Cl. 123-425.000.

Eoga, Anthony B. J., to Warner-Lambert Company. Liquid denture cleanser composition and method of application. 4,701,223, Cl. 134-2.000.

Ercilla, Jose A., to Sable and Matra Automobile. Movable seat, particularly a removable vehicle seat. 4,700,989, Cl. 297-331.000.

Erickson, Gary D.: *See*—
Dunkerton, Stephen H.; Erickson, Gary D.; and Reynolds, Gary R., 4,701,758, Cl. 340-825.480.

Erps, Lorri A.: *See*—
Beaubien, Randall S.; and Erps, Lorri A., 4,700,462, Cl. 437-187.000.

Eschermann, Guy; and Lemarquand, Pierre, to La Telemecanique Electrique. Device for snap fitting an electric apparatus onto a support bar. 4,701,067, Cl. 403-326.000.

Eschwey, Manfred; and van Bonn, Rolf, to Mexxer Griesheim GmbH. Process for preparing fluoridated surfaces of polymers. 4,701,290, Cl. 264-40.100.

Esposito, Antonio: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,701,428, Cl. 502-8.000.

Esterson, Gerald; Pismen, Moshe; and Aizenshtat, Zeev. Utilization of low grade fuels. 4,700,639, Cl. 110-347.000.

ETA S.A. Fabriques d'Ebauches: *See*—
Mock, Elmar; and Hotz, Jean-Marie, 4,700,874, Cl. 224-178.000.

ETA Systems, Inc.: *See*—
Resnick, David R.; and Bach, Randall E., 4,701,920, Cl. 371-25.000.

Ethicon, Inc.: *See*—
Jamiolkowski, Dennis D.; and Shalaby, Shalaby W., 4,700,704, Cl. 128-335.500.

Ethyl Corporation: *See*—
McKinnie, Bonnie G.; and Mitchell, Olan W., 4,701,568, Cl. 568-726.000.

Evans, Thomas L.; and Berman, Carol B., to General Electric Company. Method for polymerizing cyclic polycarbonate oligomers with catalyst comprising polymer containing alkali metal phenoxide moieties. 4,701,519, Cl. 528-371.000.

Evensen, Cato, to Scantherm A/S. Method of supplying heat energy to a metal melt or the like and a heating element for use with said method. 4,701,933, Cl. 373-117.000.

Evin, Jean, to Sarl Logilift. Method for the regulated control of a moving body carrying a variable load. 4,700,811, Cl. 187-116.000.

Exxon Chemical Patents Inc.: *See*—
Agapiou, Agapios K.; Muhle, Michael E.; and Kurtzman, Myron B., 4,701,506, Cl. 526-128.000.
Welborn, Howard C., Jr., 4,701,432, Cl. 502-113.000.

Exxon Research and Engineering Company: *See*—
Baird, William C., Jr., 4,701,255, Cl. 208-139.000.
Deckman, Harry W.; Stephens, Richard B.; Tiedje, J. Thomas; and Abeles, Benjamin, 4,701,366, Cl. 428-188.000.
Duvdevani, Ilan; Manalastas, Pacifico V.; Drake, Evelyn N.; and Thaler, Warren A., 4,701,204, Cl. 71-28.000.
Mintz, Donald J.; Peiffer, Dennis G.; Thaler, Warren A.; and Duvdevani, Ilan, 4,701,263, Cl. 210-728.000.
Pine, Lloyd A., 4,701,431, Cl. 502-73.000.
Wortel, Theodorus M., 4,701,315, Cl. 423-328.000.
Wronski, Christopher R., 4,701,395, Cl. 430-58.000.

Fabris, Mario. Roller entry guide. 4,700,875, Cl. 226-189.000.

Fahrenkrug, Anne M.: *See*—
Ellis, Louise C.; Fahrenkrug, Anne M.; Basten, Julie T.; and Milner, James D., 4,701,177, Cl. 604-385.00A.

Falciani, Marco; and Bonamigo, Roberto, to Antibiotici Cristallizzati Sterili s.r.l. Composite container for sterile solid products. 4,700,838, Cl. 206-438.000.

Faler, Gary R.; and Lynch, Jerry C., to General Electric Company. Method for preparing spirobiindane bisphenols. 4,701,566, Cl. 568-719.000.

Fambrough, David G. Line tightening mechanism. 4,700,434, Cl. 24-71.200.

Fan, Tso Y.; and Byer, Robert L., to Board of Trustees, Leland J. Stanford University. Diode laser pumped co-doped laser. 4,701,928, Cl. 372-68.000.

Fanuc Ltd.: *See*—
Kishi, Hajimu; Sakakibara, Shinsuke; and Ito, Takayuki, 4,701,686, Cl. 318-632.000.

Faress, James M., II: *See—*
Annunziata, Eugene J.; Faress, James M., II; and Stammely, Thomas E., 4,701,630, Cl. 307-112.000.

Farrand, Thomas A.: *See—*
Cantor, Eugene; and Farrand, Thomas A., 4,701,105, Cl. 416-95.000.

Farrugia, Vincent J.: *See—*
Osborn, Scott E.; Farrugia, Vincent J.; Plischke, LeMoyne W.; and Wu, Chester C., 4,701,518, Cl. 528-336.000.

Fasnacht, Floyd A., Jr.; Klahn, Frank C.; Schafer, Bruce W.; and Werner, Charles E., to Babcock & Wilcox Company, The. Sludge lance wand. 4,700,662, Cl. 122-392.000.

Fassbinder, Hans-Georg, to Klockner CRA Technologie GmbH. Apparatus for measuring a bulk stream. 4,700,578, Cl. 73-861.370.

Fathom Oceanology Limited: *See—*
Hale, Neville E., 4,700,651, Cl. 114-243.000.

Fawley, Norman C. Clock spring crack arrestor. 4,700,752, Cl. 138-172.000.

Fawzy, Moharram M., to IntraTechnology Associates, Inc. Electromechanical device with slotted stator. 4,701,656, Cl. 310-254.000.

Fedrick, Ronald M. Insulated pipe apparatus. 4,700,751, Cl. 138-149.000.

Fehr, Charles, to Firmenich SA. Utilization of a cycloaliphatic carbinol as perfuming ingredient. 4,701,278, Cl. 252-132.000.

Feinmetall GmbH: *See—*
Kruger, Gustav, 4,701,702, Cl. 324-158.00P.

Fellows, Mark W.: *See—*
Stupp, Edward H.; Fellows, Mark W.; and Steneck, Walter G., 4,701,671, Cl. 315-224.000.

Fenn, Robert W., III; Pless, Emory J.; Harris, Richard L.; and O'Leary, Kevin, to ELTECH Systems Corporation. Dimensionally stable asbestos diaphragm coated foraminous cathode. 4,701,250, Cl. 204-283.000.

Fennel, Helmut, to ITT Industries, Inc. Method and circuit configuration for suppressing undesired control actions in slip-controlled brake systems. 4,701,855, Cl. 364-426.000.

Fennell, Michael P. Bundling tie. 4,700,432, Cl. 24-16.00R.

Ferguson, Ian J.: *See—*
Patel, Ranjan C.; Ferguson, Ian J.; and Pennicott, Herbert J., 4,701,402, Cl. 430-332.000.

Ferguson, John H.: *See—*
Andrews, Rodney R.; Ferguson, John H.; Kaiser, Frederick A.; and Coman, William E., 4,701,068, Cl. 403-359.000.

Ferguson, Thomas F. W., to Cox & Company, Inc. Switching circuit with low conducted electromagnetic interference characteristics. 4,701,645, Cl. 307-570.000.

Feriauto, Robert J., Jr.; and Yuhasz, Kathleen M., to Colgate-Palmolive Company. Stable antiplaque dentifrice. 4,701,318, Cl. 424-52.000.

Fernandez, Manuel; and Frierdich, Waldo J., to Basler Electric Company. Transfer apparatus, regulating apparatus and methods. 4,701,690, Cl. 322-28.000.

Ferranti, plc: *See—*
Bruchez, Jeffrey A., 4,700,456, Cl. 439-54.000.
Waterworth, John R., 4,701,745, Cl. 340-347.0DD.

Ferreira, Leonidas, to C^3 E M Company Ltd. Miniature television transmitter. 4,701,797, Cl. 358-186.000.

FEV Forschungsgesellschaft fur Energietechnik und Verbrennungsmotoren mbH: *See—*
Pischinger, Franz; and Kreuter, Peter, 4,700,684, Cl. 123-568.000.

Figaro Engineering Inc.: *See—*
Sasaki, Kazuko, 4,701,739, Cl. 338-34.000.

Filippi, Arthur M.; and Sprecace, Richard P., to United States of America, Energy. Seal welded cast iron nuclear waste container. 4,700,863, Cl. 220-67.000.

Filper Corporation: *See—*
Banys, Algis R., 4,700,755, Cl. 141-114.000.

Finkel Outdoor Products, Inc.: *See—*
Killian, Edmund, 4,700,915, Cl. 248-188.100.

Firmenich SA: *See—*
Fehr, Charles, 4,701,278, Cl. 252-132.000.

Firmenich S.A.: *See—*
Naef, Ferdinand; and Vial, Christian, 4,701,543, Cl. 549-458.000.

First Brands Corporation: *See—*
Mohr, Paul H.; and Pepe, Enrico J., 4,701,277, Cl. 252-75.000.

Fischer, Richard J., to Gates Rubber Company, The. Radially extensible joint packing with fiber filled elastomeric core. 4,700,954, Cl. 277-165.000.

Fisher, Daniel J., Jr., to BTU Engineering Corporation. Wafer handling station. 4,701,096, Cl. 414-416.000.

Fisher, Theodore F.; Hanson, Thomas C.; and Weber, Joseph A., to Union Carbide Corporation. Process to produce helium gas. 4,701,200, Cl. 62-27.000.

Fisher, Theodore F.: *See—*
Hanson, Thomas C.; Fisher, Theodore F.; Weber, Joseph A.; and Pahade, Ravindra F., 4,701,201, Cl. 62-27.000.

Fitzig, Simon; and Weiss, Ervin. Handheld grinding device for crown preparation. 4,701,128, Cl. 433-116.000.

Fitzpatrick, Brian J., to North American Philips Corporation. Selective application of light-absorbing particles to a lenticular screen. 4,701,019, Cl. 350-127.000.

Fitzpatrick, Mark: *See—*
Chan, Albert; Fitzpatrick, Mark; Goddard, Don; Bosnyak, Robert J.; and Tsui, Cyrus, 4,701,695, Cl. 324-510.000.

Flachenecker, Gert: *See—*
Mezger, Dieter; Harsch, Georg; and Flachenecker, Gert, 4,700,478, Cl. 30-294.000.

Flax, Louis: *See—*
Davis, Lincoln R.; and Flax, Louis, 4,700,986, Cl. 297-157.000.

Flohr, Mark C., to Smith International, Inc. Pneumatic well casing pressure regulating system. 4,700,739, Cl. 137-488.000.

Fluid Dynamics, Inc.: *See—*
Anderson, Marvin H., 4,701,055, Cl. 366-336.000.

Flygstad, Dean W.; and Tromborg, Craig E., to Telex Communications, Inc. Electret transducer and method of fabrication. 4,701,640, Cl. 307-400.000.

FMC Corporation: *See—*
Cross, Stephen D., 4,700,620, Cl. 99-510.000.
Dean, Arthur L.; Kraft, Robert E.; and Marshall, Kenneth M., 4,701,647, Cl. 310-29.000.
Harris, Robert M.; and Blomquist, Arthur G., 4,700,653, Cl. 114-316.000.
Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, 4,701,539, Cl. 549-294.000.
Phillips, Richard B.; Plummer, Ernest L.; and Engel, John F., 4,701,464, Cl. 514-345.000.
Provonchee, Richard B., 4,701,754, Cl. 340-815.030.
Sturtz, Charles R., 4,701,097, Cl. 414-495.000.
Wiethoff, Roger H.; and Nelson, Gary J., 4,700,609, Cl. 89-46.000.

Foerster, Karl-Heinz: *See—*
Schuck, Helmut; Foerster, Karl-Heinz; Kuehn, Monika; and Schanze, Klaus, 4,701,757, Cl. 340-825.060.

Ford Microelectronics, Inc.: *See—*
Laude, David P.; and Noufer, Glenn E., 4,701,643, Cl. 307-450.000.

Ford Motor Company: *See—*
Bessette, Ramon L., 4,700,582, Cl. 74-409.000.
Mikkor, Mati, 4,701,424, Cl. 437-209.000.
Mikkor, Mati, 4,701,826, Cl. 361-283.000.

Forella, Guy: *See—*
Courjaret, Francois; Del Fabbro, Gilbert; Devic, Jean-Noel; Divoux, Michel; Forella, Guy; Hamant, Jean-Pierre; Tubiana, Dominique; and Pavie, Claude, 4,701,094, Cl. 414-330.000.

Foresman, Robert R. Life-saving device. 4,701,145, Cl. 441-131.000.

Forrester, Victor J.: *See—*
Pettinga, Robert; Dix, Joseph; McHugh, Thomas O.; Sibley, Lincoln L., Jr.; Ziemba, Richard T.; and Forrester, Victor J., 4,700,608, Cl. 89-11.000.

Forster, Hans R.: *See—*
Beck, Christian A.; Breslawsky, Marc C.; and Forster, Hans R., 4,701,233, Cl. 156-217.000.

Fosler, Robert C.: *See—*
Wedel, Gregory L.; Fosler, Robert C.; and Garvin, Stanley P., Jr., 4,700,493, Cl. 34-48.000.

Fossati, Giorgio; Terry, Harold; and Manco, Giuseppe, to Otis Elevator Company. Pressure-referenced programmed flow control in a hydraulic valve. 4,700,748, Cl. 137-877.000.

Foster, Thomas V., to Emhart Industries, Inc. Moulding apparatus for glassware forming machine. 4,701,202, Cl. 65-265.000.

Fought, Gerald E., to Gradall Company, The. Material handling vehicle having remote transmission controller. 4,700,802, Cl. 180-324.000.

Fourrey, Francois: *See—*
Bianchi, Francois; Busa, Denis; and Fourrey, Francois, 4,700,587, Cl. 74-527.000.

Foxcraft, Inc.: *See—*
Kubiak, Robert E., 4,700,807, Cl. 182-92.000.

Framatome & Cie: *See—*
Alibran, Patrice; Millot, Jean-Paul; and Desfontaines, Guy, 4,701,299, Cl. 376-302.000.
Millot, Jean-Paul; Alibran, Patrice; and Desfontaines, Guy, 4,701,296, Cl. 376-172.000.

Francese, Catherine; Tordeux, Marc; and Wakselman, Claude, to Rhone-Poulenc Specialties Chimiques. Process for the preparation of perfluoroalkylated alcohols and esters. 4,701,569, Cl. 568-812.000.

Francini, Joseph P.; Asbo, Einar L.; and Boston, Vincent, to Visa International Service Association. Transaction card with magnetic stripe emulator. 4,701,601, Cl. 235-449.000.

Francisco, Robert D. Faucet drain apparatus. 4,700,732, Cl. 137-107.000.

Frank, Jimmy I.; and Wolfe, John R., III, to Gagemaker, Inc. Diameter measuring device. 4,700,484, Cl. 33-142.000.

Franke, Heinrich; Joppien, Hartmut; and Franke, Helga, to Schering Aktiengesellschaft. Difluorocyclopropane derivatives and their preparation, as well as pesticidal compositions based on these compounds. 4,701,563, Cl. 568-639.000.

Franke, Helga: *See—*
Franke, Heinrich; Joppien, Hartmut; and Franke, Helga, 4,701,563, Cl. 568-639.000.

Frankel, Milton B.; and Witucki, Edward F., to Rockwell International Corporation. 1,9-difluoro-1,1,3,5,7,9,9-octanitro-3,7-diazanonane and method of preparation thereof. 4,701,557, Cl. 564-110.000.

Franklin, Austin: *See—*
Muller, Lon J.; Franklin, Austin; and George, Robert W., II, 4,701,893, Cl. 367-87.000.

Franzen, Peter: *See—*
Inge, Claes; Lagerstedt, Torgny; Borgstroem, Leonard; Carlsson, Claes-Goeran; Naebo, Sven-Olof; Moberg, Hans; and Franzen, Peter, 4,701,158, Cl. 494-74.000.

Fredericks, Peter M.: *See—*
Swinkels, Dominicus A.; Fredericks, Peter M.; and Osborn, Paul R., 4,701,838, Cl. 364-164.000.

Freisen, Ludger; Kess, Helmut; Krause, Norbert; and Meissner, Ralph, to Siemens Aktiengesellschaft. Nuclear magnetic resonance tomography apparatus. 4,701,710, Cl. 324-318.000.

Freitag, Dieter: *See—*
Kauth, Hermann; Schmidt, Manfred; Freitag, Dieter; Rudolph, Udo; and Kleiner, Frank, 4,701,554, Cl. 564-14.000.

Frequency Electronics, Inc.: *See—*
Warner, Arthur W.; and Goldfrank, Bruce, 4,701,661, Cl. 310-360.000.

Frese, John J.; and Kroll, Qnin D., to Dover Resources, Inc. Liquid level controller. 4,700,738, Cl. 137-412.000.

Fretter, Richard B. Bicycle storage system. 4,700,845, Cl. 211-18.000.

Frey, Emory L.; Looper, David W.; and Daunis, Eugene J., to Halliburton Company. Rheology test system. 4,700,567, Cl. 73-151.000.

Freyman, Bruce J.; Dorinski, Dale; and Shurboff, John, to Motorola Inc. Method of making an ultra high density pad array chip carrier. 4,700,473, Cl. 29-846.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Bretthauer, Karlheinz; and Obenauf, Hans-Dietrich, 4,701,932, Cl. 373-104.000.

Friedrich, Karl; and Lanzer, Heribert, to Steyr-Daimler-Puch AG. Drive system for motor vehicles. 4,700,800, Cl. 180-249.000.

Frierdich, Waldo J.: *See—*
Fernandez, Manuel; and Frierdich, Waldo J., 4,701,690, Cl. 322-28.000.

Froling, Melchert H.; and Schmitz, Herman J. R., to U.S. Philips Corporation. Television receiver comprising a teletext decoding circuit and a page number memory. 4,701,794, Cl. 358-147.000.

Frost, John R.; Sarich, Nancy J.; Schenz, Timothy W.; and Glatz, Alfred C., to General Foods Corporation. Chocolate product containing dipeptide-cocoa butter composition. 4,701,337, Cl. 426-548.000.

Frye, Diane R.: *See—*
Townsend, David E.; Frye, Diane R.; Greene, Tammie B.; and Perfetti, Thomas A., 4,700,726, Cl. 131-364.000.

Fu-Long, Chung. Auxiliary drawer structure on top surface on a desk. 4,700,993, Cl. 312-312.000.

Fucci, Robert C., to United Technologies Corporation. Combustors. 4,700,544, Cl. 60-757.000.

Fuchs, Fritz-Reichard; and Staendeke, Horst, to Hoechst Aktiengesellschaft. Difficultly flammable veneered or coated extruded boards. 4,701,373, Cl. 428-326.000.

Fuhr, Werner: *See—*
Brunn, Horst; Schulten, Gerd-Hermann; and Fuhr, Werner, 4,701,221, Cl. 106-304.000.

Fuisz, Richard C. Urine collecting device. 4,700,714, Cl. 128-767.000.

Fuji Electric Company Ltd.: *See—*
Hama, Toshio, 4,700,463, Cl. 437-2.000.
Hongo, Yasuo, 4,701,961, Cl. 382-34.000.

Fuji Electrochemical Co., Ltd.: *See—*
Kato, Noboru; Matsuura, Hideji; and Umemura, Shinichiro, 4,701,830, Cl. 361-395.000.

Fuji Photo Film Co., Ltd.: *See—*
Akao, Mutsuo, 4,701,359, Cl. 428-35.000.
Akimoto, Taizo; and Nagai, Asaki, 4,701,800, Cl. 358-244.000.
Katoh, Kazunobu, 4,701,400, Cl. 430-233.000.
Miyake, Izumi; Kaneko, Kiyotaka; and Oda, Kazuya, 4,701,813, Cl. 360-71.000.
Miyoshi, Takahito; Kasuga, Akira; and Fujiyama, Masaaki, 4,701,364, Cl. 428-141.000.
Nagano, Teruo; Toyama, Tadao; and Nagashima, Akira, 4,701,399, Cl. 430-179.000.
Noguchi, Masaru, 4,701,005, Cl. 350-3.700.
Oishi, Kengo; and Suzuki, Osamu, 4,701,822, Cl. 360-132.000.
Oono, Hiroshi; and Oosaka, Shigenori, 4,701,674, Cl. 315-276.000.
Satomura, Masato; Iwakura, Ken; and Kawakami, Hiroshi, 4,701,565, Cl. 568-644.000.
Tabei, Masatoshi; and Kawajiri, Kazuhiro, 4,701,798, Cl. 358-213.260.
Utsumi, Isao, 4,701,617, Cl. 250-327.200.
Yoshimura, Kazuyuki; and Sakakibara, Yoshio, 4,701,388, Cl. 430-209.000.

Fuji Xerox Co., Ltd.: *See—*
Moriguchi, Haruhiko; Inui, Toshiharu; and Ishida, Yoshihiro, 4,701,811, Cl. 358-298.000.

Fujii, Masaki; Sakai, Takao; Sakurai, Hideo; and Yamamoto, Yosiharu, to Mitsubishi Petrochemical Company Limited. Process for production of olefin polymers. 4,701,505, Cl. 526-125.000.

Fujii, Shigeru: *See—*
Takayama, Yoshihisa; Fujii, Shigeru; and Tanabe, Tomoaki, 4,701,777, Cl. 357-42.000.

Fujii, Tadashi; Yagami, Hiroyuki; Seo, Iwao; and Sasaki, Masahiro, to Terumo Corp.; and Mitsubishi Petro. Co. Piezoelectric ultrasonic transducer with flexible electrodes adhered using an adhesive having anisotropic electrical conductivity. 4,701,659, Cl. 310-334.000.

Fujii, Tatsuo, to 501 TDK Corporation. Package including disk-form magnetic recording mediums. 4,700,839, Cl. 206-444.000.

Fujikawa, Nobuyoshi; Kawaminami, Syuichi; and Yokoe, Nobuo, to Kyocera Corporation. Multilayer ceramic capacitor. 4,701,827, Cl. 361-309.000.

Fujiki, Hiroyuki; Michiura, Yoshiharu; and Abe, Masafumi, to Nissan Motor Co., Ltd. Umbrella holder for vehicle. 4,700,848, Cl. 211-63.000.

Fujikigyo Co., Ltd.: *See—*
Kohara, Soichiro, 4,700,523, Cl. 52-565.000.

Fujikura Ltd.: *See—*
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Kaji, Isao; Hasegawa, Masakazu; Tan, Masayuki; and Kurata, Masaru, 4,701,117, Cl. 425-116.000.

Fujimoto, Kyohei: *See—*
Yamamoto, Junko; Fujimoto, Kyohei; Hirasawa, Kazuhiro; and Kuboyama, Haruhiro, 4,701,763, Cl. 343-700.0MS.

Fujino, Toyomi: *See—*
Hasegawa, Norio; Fujino, Toyomi; and Matsubara, Susumu, 4,701,900, Cl. 369-36.000.

Fujita, Reiko; and Enda, Masami, to Kabushiki Kaisha Toshiba. Method for production of decontaminating liquid. 4,701,246, Cl. 204-130.000.

Fujitsu Limited: *See—*
Aneha, Nobuhiko; and Baba, Shigenori, 4,701,778, Cl. 357-45.000.
Kaneda, Takao; and Nakajima, Kazuo, 4,701,773, Cl. 357-13.000.
Kitamura, Toshiaki; and Oinaga, Yuji, 4,701,915, Cl. 371-13.000.
Matsuyama, Takayoshi; and Kobayashi, Kenichi, 4,701.859, Cl. 364-490.000.
Naitoh, Mitsugu; and Suehiro, Yoshiyuki, 4,701,919, Cl. 371-21.000.
Ogawa, Junji, 4,701,887, Cl. 365-200.000.
Takayama, Yoshihisa; Fujii, Shigeru; and Tanabe, Tomoaki, 4,701,777, Cl. 357-42.000.

Fujiwara, Hideo: *See—*
Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, 4,701,819, Cl. 360-122.000.

Fujiwara, Naohisa, to Mitsubishi Denki Kabushiki Kaisha. Selectively enabled image signal processing circuit using recursive filtering. 4,701,787, Cl. 358-36.000.

Fujiyama, Masaaki: *See—*
Miyoshi, Takahito; Kasuga, Akira; and Fujiyama, Masaaki, 4,701,364, Cl. 428-141.000.

Fukasawa, Atsushi; Sato, Takuro; Akiyama, Haruhiko; and Kawabe, Manabu, to Oki Electric Industry Co., Ltd. Adaptively coded data communication system with half duplex and/or full duplex function. 4,701,923, Cl. 371-41.000.

Fukasawa, Minoru, to Sanyo Electric Co., Ltd. Oscillation control circuit of an induction heating apparatus. 4,701,588, Cl. 219-10.770.

Fukase, Hiroshi: *See—*
Horii, Satoshi; Kameda, Yukihiko; and Fukase, Hiroshi, 4,701,559, Cl. 564-363.000.

Fuke, Akira; Tokita, Yasuhiro; and Masuda, Katsuhiko, to Koito Seisakusho Co., Ltd. Electric control system for a metal ion laser. 4,701,925, Cl. 372-38.000.

Fukuda, Yukihiro: *See—*
Nishikawa, Masao; Miyake, Junichi; Sakurai, Yoshimi; and Fukuda, Yukihiro, 4,700,819, Cl. 192-3.620.

Fukui, Katsuhiko: *See—*
Miki, Kazuo; Hayashi, Yasutaka; Fukui, Katsuhiko; and Sumi, Kazumasa, 4,700,960, Cl. 280-91.000.

Fukumura, Kagenori: *See—*
Yasue, Hideki; and Fukumura, Kagenori, 4,700,591, Cl. 74-868.000.

Fukushima, Masakazu: *See—*
Oku, Kentaro; Fukushima, Masakazu; Suzuki, Hitomi; and Maruyama, Masanori, 4,701,668, Cl. 315-17.000.

Fukuyoshi, Minoru; Furuto, Takashi; and Nakamura, Tetsuo, to Mitutoyo Mfg. Co., Ltd. Non-directional touch signal probe. 4,701,704, Cl. 324-207.000.

Fumey, Jurg, to Suhner Intertrade AG. Multipurpose machining unit. 4,701,082, Cl. 408-127.000.

Funakoshi, Satoshi: *See—*
Ueda, Yasuo; Kagitani, Yoshio; Komeda, Shirou; and Funakoshi, Satoshi, 4,701,325, Cl. 424-164.000.

Funayama, Shinji: *See—*
Komiyama, Kanki; Funayama, Shinji; and Umezawa, Iwao, 4,701,324, Cl. 424-118.000.

Furuhata, Takashi: *See—*
Mitsukuchi, Kunio; Ito, Hiromitsu; Eguchi, Isamu; Hirasato, Bunji; and Furuhata, Takashi, 4,701,583, Cl. 200-148.00B.

Furuto, Takashi: *See—*
Fukuyoshi, Minoru; Furuto, Takashi; and Nakamura, Tetsuo, 4,701,704, Cl. 324-207.000.

Furuyama, Hideto: *See—*
McIlroy, Paul W. A.; Kurobe, Atsushi; and Furuyama, Hideto, 4,701,774, Cl. 357-17.000.

Futaba Denshi Kogyo Kabushiki Kaisha: *See—*
Watanabe, Hiroshi; and Shimizu, Yukihiko, 4,701,670, Cl. 315-169.300.

Futakata, Takashi: *See—*
Tajima, Noriyasu; Sakura, Yasuhiro; Futakata, Takashi; Senda, Kouji; and Seki, Kazuaki, 4,700,792, Cl. 177-178.000.

Futatsumori, Koji: *See—*
Itoh, Kunio; Shiobara, Toshio; Futatsumori, Koji; Tomiyoshi, Kazutoshi; and Shimizu, Hisashi, 4,701,482, Cl. 523-435.000.

Futura Nova B.V.: *See—*
Kist, Joost, 4,700,713, Cl. 128-756.000.

G&C Home & Leisure Supplies Limited: *See—*
Cheetham, Donald O., 4,700,914, Cl. 248-155.100.

G.D Societa' per Azioni: *See—*
Mattei, Riccardo; and Brizzi, Marco, 4,700,825, Cl. 198-419.000.

GA Technologies Inc.: *See—*
West, William P.; and Muller, Clifford H., III, 4,701,616, Cl. 250-251.000.

Gabriel, Kaigham J.; Trimmer, William S. N.; and Walker, James A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Shape memory alloy actuator. 4,700,541, Cl. 60-528.000.

Gademann, Lothar; Mattes, Bernhard; Mausner, Eberhard; Suchowerskyj, Wadym; and Rittmannsberger, Norbert, to Robert Bosch

GmbH. Trigger system for a vehicular passenger restraint system. 4,700,973, Cl. 280-735.000.
Gaertner, Hubert: *See—*
Bercovici, Daniel; Gaertner, Hubert; and Puigserver, Antoine, 4,701,328, Cl. 426-2.000.
Gagemaker, Inc.: *See—*
Frank, Jimmy I.; and Wolfe, John R., III, 4,700,484, Cl. 33-142.000.
Gagnieur, Andre: *See—*
Decaudin, Robert; Gurtner, Bernard; and Gagnieur, Andre, 4,701,564, Cl. 568-639.000.
Gajjar, Jagdish T.: *See—*
Stutt, Charles A.; and Gajjar, Jagdish T., 4,701,939, Cl. 375-115.000.
Galiasso, Roberto E.: *See—*
Garcia, Juan J.; Galiasso, Roberto E.; Ramirez de Agudelo, Magdalena M.; Rivas, Luis; and Hurtado, Juan, 4,701,435, Cl. 502-252.000.
Galileo Electro-Optics Corp.: *See—*
Tosswill, Christopher H., 4,701,618, Cl. 250-330.000.
Gallavan, Kevin P.: *See—*
Taylor, Dennis R.; and Gallavan, Kevin P., 4,701,438, Cl. 502-405.000.
Galles, Henri; and Elias, Bernard, to Regie Nationale des Usines Renault. Synthetic material vehicle fuel tank. 4,700,864, Cl. 220-86.00R.
Gambuti, Patrick F.; and Martino, Louis I. Mobile display apparatus. 4,701,627, Cl. 296-21.000.
Gammons, Clifford E., to Span America Medical Systems, Inc. Applicator with fulcrum for bending. 4,701,168, Cl. 604-310.000.
Gandini, Alberto: *See—*
Roggero, Arnaldo; and Gandini, Alberto, 4,701,498, Cl. 525-293.000.
Garcia, Juan J.; Galiasso, Roberto E.; Ramirez de Agudelo, Magdalena M.; Rivas, Luis; and Hurtado, Juan, to Intevep, S.A. Catalyst and method of preparation from a naturally occurring material. 4,701,435, Cl. 502-252.000.
Gardner, Ralph F. Process for crushing cans. 4,700,950, Cl. 273-1.0GH.
Garrett, Brian D.: *See—*
Gupta, Chakra V.; and Garrett, Brian D., 4,701,575, Cl. 174-107.000.
Garrett Corporation, The: *See—*
Gu, Alston L., 4,701,060, Cl. 384-106.000.
Garrison, David A.: *See—*
Bass, Vance R.; Bonebrake, Veronica A.; Garrison, David A.; Landis, James K.; Neff, Mary S.; Urquhart, Robert J.; and Williams, Susan C., 4,701,851, Cl. 364-419.000.
Gartside, Charles H., III; Levy, Alvin C.; Overton, Bob J.; and Taylor, Carl R., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Thixotropic grease composition and cable comprising same. 4,701,016, Cl. 350-96.230.
Garvin, Stanley P., Jr.: *See—*
Wedel, Gregory L.; Fosler, Robert C.; and Garvin, Stanley P., Jr., 4,700,493, Cl. 34-48.000.
Gates Rubber Company, The: *See—*
Fischer, Richard J., 4,700,954, Cl. 277-165.000.
Gebr. Hennig GmbH: *See—*
Stohr, Albert, 4,700,517, Cl. 52-241.000.
Gebr. Marzhauser Wetzlar oHG: *See—*
Marzhauser, Heinz, 4,700,585, Cl. 74-479.000.
Gehring, Johann: *See—*
Birkle, Siegfried; and Gehring, Johann, 4,701,248, Cl. 204-201.000.
Geiger, John T.: *See—*
Stillman, Neil W.; and Geiger, John T., 4,701,286, Cl. 261-36.100.
Geiman, Richard A.: *See—*
Maas, Lawrence W.; Geiman, Richard A.; and Adams, Charles T., 4,701,254, Cl. 208-26.000.
Geiszler, Willard A., Jr., to Philip Morris Incorporated. Adjustable filter cigarette. 4,700,725, Cl. 131-336.000.
Geithman, Glenn A.; and Gilbert, Dennis H., to Boeing Company, The. Ultrasonic transducer with shaped beam intensity profile. 4,700,575, Cl. 73-642.000.
General Dynamics Land Systems, Inc.: *See—*
Cory, Robert M., 4,700,992, Cl. 305-51.000.
General Dynamics, Pomona Division: *See—*
Wong, Joseph S., 4,701,727, Cl. 333-204.000.
General Electric Company: *See—*
Alley, Robert P.; and Bicknell, William H., 4,701,680, Cl. 315-287.000.
Andrews, Edward W.; and Schley, Roy A., 4,701,795, Cl. 358-150.000.
Devine, Thomas M., Jr., 4,700,882, Cl. 228-194.000.
Evans, Thomas L.; and Berman, Carol B., 4,701,519, Cl. 528-371.000.
Faler, Gary R.; and Lynch, Jerry C., 4,701,566, Cl. 568-719.000.
Hardy, Christopher J.; and Dumoulin, Charles L., 4,701,708, Cl. 324-311.000.
Kaiser, Bruce J.; Walker, Edward S.; Tunnell, George W.; and Masaitis, William, 4,701,621, Cl. 250-435.000.
Penney, Carl M.; and Thomas, Bradley S., 4,701,031, Cl. 350-371.000.
Pettinga, Robert; Dix, Joseph; McHugh, Thomas O.; Sibley, Lincoln L., Jr.; Ziemba, Richard T.; and Forrester, Victor J., 4,700,608, Cl. 89-11.000.
Rosenquist, Niles R., 4,701,516, Cl. 528-176.000.
Rosenquist, Niles R., 4,701,537, Cl. 549-228.000.
Rosenquist, Niles R.; and Miller, Kenneth F., 4,701,538, Cl. 549-228.000.
Silva, James M., 4,701,544, Cl. 558-281.000.
Stutt, Charles A.; and Gajjar, Jagdish T., 4,701,939, Cl. 375-115.000.
Ulug, Mehmet E., 4,701,910, Cl. 370-85.000.
Ulug, Mehmet E., 4,701,911, Cl. 370-85.000.
Valenty, Vivian B., 4,701,511, Cl. 528-26.000.
General Foods Corporation: *See—*
Frost, John R.; Sarich, Nancy J.; Schenz, Timothy W.; and Glatz, Alfred C., 4,701,337, Cl. 426-548.000.
Rogers, Ann M.; El-Hag, Nabil A.; and Shenouda, Soliman Y. K., 4,701,330, Cl. 426-270.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,701,552, Cl. 562-498.000.
General Motors Corporation: *See—*
Jozefczak, Thadius F., 4,700,980, Cl. 296-1.00S.
Kroetsch, Karl P.; and Wolf, Peter G., 4,700,469, Cl. 29-726.000.
General Telephone Company of Indiana: *See—*
Hoff, Terry E., 4,701,699, Cl. 324-133.000.
Gentex Corporation: *See—*
Westgate, Charles A., 4,700,410, Cl. 2-423.000.
Georg Fischer Aktiengesellschaft: *See—*
Bernath, Oskar, 4,700,758, Cl. 144-118.000.
Georg Utz AG: *See—*
Boeniger, Hanspeter, 4,700,855, Cl. 213-75.0TC.
George, Robert W., II: *See—*
Muller, Lon J.; Franklin, Austin; and George, Robert W., II, 4,701,893, Cl. 367-87.000.
Gerber Garment Technology: *See—*
Weiselfish, Jacob; and Collins, George, 4,700,633, Cl. 104-102.000.
Gerber, Heinz J., to Gerber Scientific, Inc. Method for working on woven fabric wound on a supply roll. 4,700,598, Cl. 83-14.000.
Gerber Scientific, Inc.: *See—*
Gerber, Heinz J., 4,700,598, Cl. 83-14.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Meissner, Horst, 4,701,079, Cl. 405-296.000.
Gewerkschaft Eisenhutte Westfalia GmbH: *See—*
Wisniewski, Paul; and Golla, Franz, 4,701,249, Cl. 204-279.000.
Geyer, Werner: *See—*
Schierling, Roland; Geyer, Werner; Wissmann, Michael; and Nickel, Hans, 4,700,668, Cl. 123-73.00C.
Giatras, James L.; Mang, Warren G.; Marino, Charles P.; Needling, Michael C.; and Pezdirtz, George F., to Markel Corporation. Process for applying polymeric coatings, and resulting coated articles. 4,701,345, Cl. 427-45.100.
Gibbons, Charles E.; and Whillock, Allan A., to International Paper Company. Heat sealable barrier material for improved juice packaging (EVOH). 4,701,360, Cl. 428-35.000.
Gibbs, Andrew R.: *See—*
Isherwood, Jonathan M.; and Gibbs, Andrew R., 4,701,747, Cl. 340-365.00P.
Gibbs, David L. Method and apparatus utilizing agar diffusion technique for determining quantitative drug concentration parameter. 4,701,850, Cl. 364-415.000.
Gibbs, Dudley F.; Greenhalgh, Marilyn E.; Watson, James H. P.; Yeo, Richard G.; and Ellwood, Derek C., to Bio Separation Limited. Process for the separation of metals from aqueous media. 4,701,261, Cl. 210-606.000.
Gibson, John A. Touch control adaptor. 4,701,676, Cl. 315-362.000.
Giddings, Gary M., to Discovision Associates. Method and apparatus for locating a selected track on a record disc. 4,701,898, Cl. 369-32.000.
Gigandet, Richard W.: *See—*
Bratton, Ronald E.; Gigandet, Richard W.; Henke, Mitchell C.; Kaminski, Daniel S.; and Wibel, Michelle A., 4,701,340, Cl. 426-511.000.
Gilbert, Dennis H.: *See—*
Geithman, Glenn A.; and Gilbert, Dennis H., 4,700,575, Cl. 73-642.000.
Gilbert, Raymond: *See—*
Dutil, Robert; and Gilbert, Raymond, 4,701,152, Cl. 474-70.000.
Giordano, Ronald M.: *See—*
Thach, Sophany; Salter, Stephen J.; Meyers, Kevin O.; and Giordano, Ronald M., 4,701,271, Cl. 252-8.554.
Giovanola Freres SA: *See—*
Schmutz, Bernard P., 4,700,632, Cl. 104-63.000.
Gipson, Lamar H.: *See—*
Batina, William P.; and Gipson, Lamar H., 4,700,707, Cl. 128-419.0PT.
Gisi, Ulrich: *See—*
Kaspers, Helmut; Duben, Jiri; and Gisi, Ulrich, 4,701,454, Cl. 514-245.000.
Gitzendanner, Louis G., to Magnetic Peripherals Inc. Means for indexing a rotary arm in small angular steps. 4,701,818, Cl. 360-106.000.
Gjelsvik, Atle: *See—*
Person, Joel I.; and Gjelsvik, Atle, 4,700,519, Cl. 52-334.000.
Gladding, Samuel. Swag bag. 4,700,761, Cl. 150-111.000.
Gladney, Tommy C.; and Baker, William E. Ramp for loading small motorized vehicles on pickup trucks. 4,700,421, Cl. 14-69.500.
Glaser, Gerhard; Lindae, Gerhard; Perthus, Peter; and Rein, Heinz, to Robert Bosch GmbH. Headlight for dim head lamps of motor vehicles. 4,701,834, Cl. 362-307.000.
Glatz, Alfred C.: *See—*
Frost, John R.; Sarich, Nancy J.; Schenz, Timothy W.; and Glatz, Alfred C., 4,701,337, Cl. 426-548.000.
Glaug, Frank S.; Luceri, Thomas J.; and Parr, Deborah J., to Personal Products, Inc. Sanitary napkins with flaps. 4,701,178, Cl. 604-387.000.

Glenco Manufacturing, Inc.: *See*—
Neville, Glen F., 4,701,348, Cl. 427-57.000.
Glenn, William E., to New York Institute of Technology. Technique for encoding and decoding video with improved separation of chrominance and luminance. 4,701,783, Cl. 358-12.000.
Glover, Steven L., to Westinghouse Electric Corp. Process for manufacturing electrical equipment utilizing printed circuit boards. 4,700,880, Cl. 228-180.100.
GMT Novotny GmbH: *See*—
Probst, Georg, 4,700,999, Cl. 439-271.000.
GNB Incorporated: *See*—
Kump, William H.; and Jergl, Joseph J., 4,701,386, Cl. 429-179.000.
Gnidovec, Joze: *See*—
Kobe, Joze; Gnidovec, Joze; and Zupet, Pavle, 4,701,526, Cl. 544-251.000.
Goddard, Don: *See*—
Chan, Albert; Fitzpatrick, Mark; Goddard, Don; Bosnyak, Robert J.; and Tsui, Cyrus, 4,701,695, Cl. 324-510.000.
Godderidge, Volker, to GSR Sandregenerierungsgesellschaft mbH. Process and apparatus for reclaiming foundry scrap sands. 4,700,766, Cl. 164-5.000.
Goida, Thomas M.: *See*—
Winslow, Russell T.; and Goida, Thomas M., 4,700,935, Cl. 269-126.000.
Goldfrank, Bruce: *See*—
Warner, Arthur W.; and Goldfrank, Bruce, 4,701,661, Cl. 310-360.000.
Goldman, Jacob: *See*—
Resnick, Semion; and Goldman, Jacob, 4,700,703, Cl. 128-334.00R.
Golla, Franz: *See*—
Wisniewski, Paul; and Golla, Franz, 4,701,249, Cl. 204-279.000.
Goller, Ernst; and Walker, Fritz, to H. Stoll GmbH & Co. Yarn tensioning device for flat knitting machines. 4,700,553, Cl. 66-146.00R.
Gonczy, Stephen T.: *See*—
Lester, George R.; Gonczy, Stephen T.; Welsh, Lawrence B.; and Stranford, Gerald T., 4,701,316, Cl. 423-344.000.
Good, Robert S.; Scully, Michael J.; and Zelko, William E., to AMP Incorporated. Shielded cable assembly. 4,701,139, Cl. 439-497.000.
Goodman, Lawrence A.: *See*—
Dolny, Gary M.; and Goodman, Lawrence A., 4,700,460, Cl. 437-81.000.
Goodman, Robert W., to Data General Corporation. Video control section for a data processing system. 4,701,865, Cl. 364-521.000.
Goodrich, Gerald O.; Tehranian, Michael M.; and White, Donald A., to Digital Equipment Corporation. System for altering data transmission modes. 4,701,841, Cl. 364-200.000.
Goodyear, Nelson. Office organizer for desks. 4,700,829, Cl. 206-214.000.
Goodyear Tire & Rubber Company, The: *See*—
Hsu, Wen-Liang, 4,701,561, Cl. 568-492.000.
Landers, Samuel P., 4,700,762, Cl. 152-209.00R.
Mate, Robert D.; Parker, Dane K.; and Blackwell, James C., 4,701,507, Cl. 526-208.000.
Goossens, Walter: *See*—
Weyers, Charles; Klein, Michel; and Goossens, Walter, 4,701,194, Cl. 55-228.000.
Gordon Barlow Design: *See*—
Barlow, Gordon A., 4,701,056, Cl. 368-89.000.
Gosnell, Calvin B.: *See*—
Hawkins, Wallace H.; and Gosnell, Calvin B., 4,700,966, Cl. 280-432.000.
GPD Canada Inc.: *See*—
Storimans, Franciscus J. A., 4,700,753, Cl. 140-147.000.
Graafland, Teunis, to Shell Oil Company. Process for the preparation of water-soluble vinyl saccharide polymers. 4,701,494, Cl. 524-811.000.
Grabitz, Ernst B., to DOX-AL Italia SpA. Non-dusty blends of meals or flours with active principles for use in fodder production. 4,701,331, Cl. 426-302.000.
Graco Inc.: *See*—
Murphy, Edward P., 4,700,741, Cl. 137-543.190.
Gradall Company, The: *See*—
Fought, Gerald E., 4,700,802, Cl. 180-324.000.
Gramling, William D. Dual-action retrieving tool for oil well swabs. 4,700,775, Cl. 166-98.000.
Grare, Didier; and Salkin, Herve, to Vallourec. Process and device for executing the screwing of a threaded joint for tubes, equipped with a stop. 4,700,576, Cl. 73-761.000.
Grassl, Hans-Peter, to Siemens Aktiengesellschaft. Dispersive interdigital transducer for arrangements operating with acoustic waves. 4,701,657, Cl. 310-313.00C.
Grau, Ulrich, to Hoechst Aktiengesellschaft. Insulin derivatives, processes for their preparation and their use, and pharmaceutical agents for the treatment of diabetes mellitus. 4,701,440, Cl. 514-3.000.
Gray, Robert R.; and Lindahl, Thomas G. Elevated temperature dehydration section for particle drying pulse jet combustion systems. 4,701,126, Cl. 432-58.000.
Great Plains Industries, Inc.: *See*—
Hall, Robert E., 4,700,579, Cl. 73-861.780.
Grebur, Dennis J.: *See*—
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,701,501, Cl. 525-449.000.
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,701,502, Cl. 525-449.000.
Green Cross Corporation, The: *See*—
Ueda, Yasuo; Kagitani, Yoshio; Komeda, Shirou; and Funakoshi, Satoshi, 4,701,325, Cl. 424-164.000.
Green, Frank L. Device for stacking and wrapping coins. 4,700,533, Cl. 53-532.000.
Green, James A., II: *See*—
Young, Donald C.; and Green, James A., II, 4,701,555, Cl. 564-38.000.
Greenberg, Richard N., to St. Louis University. Inhibition of diarrhea induced by *escherichia coli* heat-stable enterotoxin. 4,701,458, Cl. 514-280.000.
Greene, Tammie B.: *See*—
Townsend, David E.; Frye, Diane R.; Greene, Tammie B.; and Perfetti, Thomas A., 4,700,726, Cl. 131-364.000.
Greene, Tracy D.: *See*—
Kupferschmidt, Albert; Greene, Tracy D.; and Jaycox, Donald F., 4,700,995, Cl. 439-276.000.
Greenhalgh, Marilyn E.: *See*—
Gibbs, Dudley F.; Greenhalgh, Marilyn E.; Watson, James H. P.; Yeo, Richard G.; and Ellwood, Derek C., 4,701,261, Cl. 210-606.000.
Greenwood, Arthur R., to UOP Inc. Catalyst regeneration with varying air flow to burn-off zone from drying zone through halogenation zone. 4,701,429, Cl. 502-37.000.
Gregory, James L., to Owens-Illinois Closure Inc. Tamper indicating closure. 4,700,859, Cl. 215-252.000.
Greyhawk Systems, Inc.: *See*—
Loucks, Bryan E., 4,701,018, Cl. 350-174.000.
Griffin, Edward L.: *See*—
Bahl, Inder J.; and Griffin, Edward L., 4,701,573, Cl. 174-52.0FP.
Griffith, William R. Packaging wrap. 4,700,844, Cl. 206-586.000.
Griffiths, William A.: *See*—
Bates, Kenneth W.; and Griffiths, William A., 4,701,215, Cl. 75-53.000.
Groesch, Lothar; Netzer, Gabriel; and Kassing, Lothar, to Daimler-Benz Aktiengesellschaft. Dummy for car crash testing. 4,701,132, Cl. 434-274.000.
Gronwald, Gerd: *See*—
Wysk, Hans-Joachim; Stellmach, Dieter; Nolte, Bernhard; Gronwald, Gerd; and Maedge, Werner, 4,701,063, Cl. 400-621.000.
Grooms, Dennis B., Jr. Cigarette incense ashtray holder. 4,700,721, Cl. 131-238.000.
Groshong, LeRoy E.; and Brawn, Ronald J., to Catheter Technology Corp. Valved two-way catheter. 4,701,166, Cl. 604-247.000.
Gross, James R., to Kendall Company, The. Medical equipment mounting apparatus. 4,700,922, Cl. 248-558.000.
Grossman, Stanley J., to Keith and Grossman Leasing Company. Composite, pre-stressed structural member and method of forming same. 4,700,516, Cl. 52-223.00R.
Gruet, Victor B., to Computer Information System, Inc. Pouch assembly for computer container. 4,701,003, Cl. 439-680.000.
Grumman Aerospace Corporation: *See*—
Corbett, Marshall J., 4,700,912, Cl. 244-63.000.
Mead, Albert R., 4,701,293, Cl. 264-258.000.
Grundke, Ulrich: *See*—
Jellinek, Karl; Meier, Bert; and Grundke, Ulrich, 4,701,478, Cl. 522-97.000.
Gruner, Manfred, to Mannesmann Aktiengesellschaft. Controlling a d.c. motor. 4,701,685, Cl. 318-309.000.
Grunwald, John J.; and Spencer, Allen C., to MacDermid, Incorporated. Thermally stabilized photoresist images. 4,701,390, Cl. 430-325.000.
Grusin, Gerald M., to Dart Industries, Inc. Stackable storage container. 4,700,842, Cl. 206-508.000.
Grzych, Leo J. Fire nozzle assembly. 4,700,894, Cl. 239-555.000.
GSR Sandregenerierungsgesellschaft mbH: *See*—
Godderidge, Volker, 4,700,766, Cl. 164-5.000.
GTE Laboratories Incorporated: *See*—
Sarin, Vinod K.; and Hintermann, Hans E., 4,701,384, Cl. 428-688.000.
GTE Products Corporation: *See*—
Orbanic, Robert S., 4,701,140, Cl. 439-751.000.
Gu, Alston L., to Garrett Corporation, The. Foil journal bearing cooling. 4,701,060, Cl. 384-106.000.
Guckenberger, Anthony C.: *See*—
Hsu, Joseph C.; and Guckenberger, Anthony C., 4,700,531, Cl. 53-412.000.
Guenther, Rolf A.: *See*—
Peters, Stanley T.; Kolek, Robert L.; Guenther, Rolf A.; Anderson, Jeffrey J.; and Marshall, Clarence F., 4,701,231, Cl. 156-172.000.
Guerriero, Renato: *See*—
Baradel, Agostino; Guerriero, Renato; and Veronese, Giuseppe, 4,701,311, Cl. 423-87.000.
Guillaumin, Jacquest, to Jeumont-Schneider Corporation. Logic circuit producing a direct-current output signal of determined maximum intensity. 4,701,632, Cl. 307-261.000.
Guim, Raul. Safety booster cables with time delay. 4,701,688, Cl. 320-25.000.
Gunkel, Hans-Dieter; and Rohrle, Josef, to Siemens Aktiengesellschaft. Apparatus for assigning addresses to pluggable modules based on contact configuration. 4,701,878, Cl. 364-900.000.
Guo, Jeng-Joung: *See*—
Wan, Shyue-Yun; Guo, Jeng-Joung; and Lin, Cheng-Fung, 4,701,937, Cl. 375-25.000.
Guojiu, Li: *See*—
Yuan, Ren; Xianzhi, Chen; Yuanxi, Feng; Guojiu, Li; Dake, Huang; Yongli, Zhang; and Quanzhong, Sun, 4,701,689, Cl. 322-19.000.

Gupta, Chakra V.; and Garrett, Brian D., to Comm/Scope Company. Jacketed cable with powder layer for enhanced corrosion and environmental protection. 4,701,575, Cl. 174-107.000.

Gurtner, Bernard: *See*—
Decaudin, Robert; Gurtner, Bernard; and Gagnieur, Andre, 4,701,564, Cl. 568-639.000.

Gurubatham, Vincent P.: *See*—
Eichman, Carl E.; Gurubatham, Vincent P.; Hauch, Dennis W.; and Kinyon, Garrett K., 4,700,554, Cl. 68-17.00R.

Gutek, Beth I.: *See*—
Kookootsedes, Gust J.; Reese, Herschel H.; Gutek, Beth I.; and Pretzer, Gale H., 4,701,017, Cl. 350-96.340.

Gutierrez, Eddie N.: *See*—
Koermer, Gerald S.; Gutierrez, Eddie N.; and Prorok, Maryfrances, 4,701,527, Cl. 544-277.000.

Guyot, Lucien, to Thomson-CSF. Picture tube with video output, picture taking system utilizing such tube and operating process of said tube. 4,701,792, Cl. 358-111.000.

H. Stoll GmbH & Co.: *See*—
Goller, Ernst; and Walker, Fritz, 4,700,553, Cl. 66-146.00R.

H. Wohlenberg KG GmbH & Co.: *See*—
Strate, Hans; and Simon, Hans-Dieter, 4,700,453, Cl. 29-568.000.

Haacke, E. Mark, to Picker International, Inc. Generalized reconstruction technique. 4,701,706, Cl. 324-309.000.

Haaser, Michael J., to Advanced Manufacturing Systems, Incorporated. Vibratory feeder arrangement. 4,700,827, Cl. 198-771.000.

Haddock, Richard, to Drexler Technology Corporation. Data card cassette. 4,700,840, Cl. 206-449.000.

Haditsch, Werner, to BBC Brown, Boveri & Company, Limited. Conductor winding assembly for a gas-cooled electric machine. 4,701,648, Cl. 310-61.000.

Haehn, Peter C., to Linde Aktiengesellschaft. Process for recovering methylacetylene and/or propadiene. 4,701,190, Cl. 55-49.000.

Haeno, Akira: *See*—
Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, 4,701,902, Cl. 369-77.100.

Haentjens, Walter D. Shaft mounted bearing lubricating device. 4,700,808, Cl. 184-6.180.

Hafner, Hans W., to Pfister GmbH. Device for dividing vector forces into their components. 4,700,566, Cl. 73-147.000.

Hafner, Warren G.: *See*—
DiGiulio, Peter C.; Hafner, Warren G.; and Stalzer, Henry, 4,701,856, Cl. 364-466.000.

Hagberg, Calvin A., to Litton Systems, Inc. Magnetron mounting system. 4,701,586, Cl. 219-10.55R.

Hagen, Hans, to Bayerische Motoren Werke Aktiengesellschaft. Windshield washing system for motor vehicles. 4,700,424, Cl. 15-250.040.

Hager, Karl-Heinz; Henneberg, Peter; and Juranek, Hans-Joachim, to Carl-Zeiss-Stiftung. Optical arrangement for transmitting high-intensity radiation. 4,701,023, Cl. 350-321.000.

Hagler, Andrew J., to Case-Hoyt. Method and apparatus for marking defective portions of a printed web. 4,700,627, Cl. 101-426.000.

Hailey, Laurence N.: *See*—
Boecker, Wolfgang D. G.; Hailey, Laurence N.; and McMurtry, Carl H., 4,701,427, Cl. 501-92.000.

Hakim, John, to Petrolite Corporation. Extrusion processing aid composition and polyolefin containing same. 4,701,487, Cl. 524-229.000.

Hale, Neville E., to Fathom Oceanology Limited. Fairing for towcables. 4,700,651, Cl. 114-243.000.

Hale, Stuart G.: *See*—
Naven, Finbar; and Hale, Stuart G., 4,701,916, Cl. 371-15.000.

Haley, Richard J., to Quality Jewelry, Inc. Convertible earring construction. 4,700,552, Cl. 63-12.000.

Hall, Johnce E.: *See*—
Chiu, Hin; and Hall, Johnce E., 4,701,076, Cl. 405-224.000.

Hall, Robert E., to Great Plains Industries, Inc. Digital flow meter for dispensing fluids. 4,700,579, Cl. 73-861.780.

Hall, Stephen G., to Wimpey Laboratories Limited. Apparatus for forming a grouted member in deep water. 4,701,074, Cl. 405-169.000.

Hallberg, Mats: *See*—
Carlsson, H. Roger; Schwartz, Stephan; and Hallberg, Mats, 4,701,265, Cl. 210-744.000.

Halliburton Company: *See*—
Berryman, Leslie N.; Davis, Gail F.; and Horinek, Herbert J., 4,701,095, Cl. 414-332.000.
Frey, Emory L.; Looper, David W.; and Daunis, Eugene J., 4,700,567, Cl. 73-151.000.
Luers, Thomas J., 4,700,777, Cl. 166-185.000.
Mallett, A. J.; and Minear, John W., 4,700,803, Cl. 181-106.000.
Smith, Michael L.; and Hensley, Donald E., 4,700,778, Cl. 166-250.000.

Halliburton Services: *See*—
Brothers, Lance E., 4,700,780, Cl. 166-293.000.

Halstead, W. G.: *See*—
Shimirak, Gerlad L.; Hunter, Thomas; Story, Martha F.; Halstead, W. G.; Chan, Paul S.; and Swinmurn, Christopher J., 4,701,574, Cl. 174-93.000.

Halverson, Thomas R.: *See*—
Wilkinson, James P.; and Halverson, Thomas R., 4,701,750, Cl. 340-384.00E.

Hama, Toshio, to Fuji Electric Company Ltd. Non-crystalline semiconductor solar battery and method of manufacture thereof. 4,700,463, Cl. 437-2.000.

Hamant, Jean-Pierre: *See*—
Courjaret, Francois; Del Fabbro, Gilbert; Devic, Jean-Noel; Divoux, Michel; Forella, Guy; Hamant, Jean-Pierre; Tubiana, Dominique; and Pavie, Claude, 4,701,094, Cl. 414-330.000.

Hamel, Esther V. M.: *See*—
Kelly, L. Thomas; Hamel, Esther V. M.; and Bielka, Robert P., 4,701,180, Cl. 604-891.000.

Hamernik, Edward L.; and Patterson, Daryll D., to Tescom Corporation. Fluid actuated valve apparatus. 4,700,735, Cl. 137-270.000.

Hamilton Industries, Inc.: *See*—
Bastian, John M.; Pflieger, David C.; and Beck, Marshall K., 4,700,916, Cl. 248-225.200.

Hammerle AG: *See*—
Hanni, Eduard; and Zweili, Markus, 4,700,599, Cl. 83-94.000.

Hammett, Roy, to International Container Systems, Inc. Universal case for transporting bottles. 4,700,836, Cl. 206-427.000.

Hammett, Roy, to International Container Systems, Inc. Universal bottle case. 4,700,837, Cl. 206-427.000.

Hanafusa, Tooru; Kinugasa, Yukio; and Yaegashi, Takehisa, to Toyota Jidosha Kabushiki Kaisha. Fuel injection system for an internal combustion engine. 4,700,681, Cl. 123-478.000.

Handschuch, Karl, to Schubert & Salzer. Open-end spinning device. 4,700,539, Cl. 57-401.000.

Handy Button Machine Company: *See*—
Bush, Earl D., 4,700,435, Cl. 24-94.000.

Haneda, Makoto: *See*—
Naka, Hiroshi; Seko, Ichiro; Kobayashi, Shuji; and Haneda, Makoto, 4,701,927, Cl. 372-46.000.

Hankins, Kevin T.; Michael, Mark W.; Moser, Jay D.; and Rosier, Brian K., to Harris Corporation. Integrated verticle NPN and vertical oxide fuse programmable memory cell. 4,701,780, Cl. 357-51.000.

Hankinson, Julian E., Jr., to Young Engineering Inc. Joining continuous lengths of web materials. 4,700,642, Cl. 112-121.140.

Hanni, Eduard; and Zweili, Markus, to Hammerle AG. Apparatus for removing and stacking of sheet metal strips cut by a plate shear. 4,700,599, Cl. 83-94.000.

Hans, Waldemar; Kind, Wilhelm; Knapp, Heinrich; Kramer, Wolfgang; and Sauer, Rudolf, to Robert Bosch GmbH. Electromagnetically actuatable fuel injection valve. 4,700,891, Cl. 239-132.500.

Hansen, Albert F. Pipe coupling. 4,700,926, Cl. 251-149.800.

Hansen, Donald J.: *See*—
Ramachandran, Sundaresan; Skiles, David O.; and Hansen, Donald J., 4,701,309, Cl. 423-20.000.

Hansen, Parley E.: *See*—
Allebest, Edward F.; Hansen, Parley E.; Walsh, George A.; and Maguire, Walter R., 4,701,896, Cl. 369-32.000.

Hanson, Allan W.; and Christiansen, Theron L., to Hughes Aircraft Company. Pivotable conical joint for waveguides. 4,701,731, Cl. 333-257.000.

Hanson, Thomas C.; Fisher, Theodore F.; Weber, Joseph A.; and Pahade, Ravindra F., to Union Carbide Corporation. Process to produce cold helium gas for liquefaction. 4,701,201, Cl. 62-27.000.

Hanson, Thomas C.: *See*—
Fisher, Theodore F.; Hanson, Thomas C.; and Weber, Joseph A., 4,701,200, Cl. 62-27.000.

Hanyu, Susumu: *See*—
Eguchi, Yasukata; Hanyu, Susumu; Hara, Kazumasa; and Koike, Mikio, 4,700,644, Cl. 112-255.000.

Happy Jack, Inc.: *See*—
Williams, Clarence O., 4,700,506, Cl. 43-113.000.

Hara, Kazumasa: *See*—
Eguchi, Yasukata; Hanyu, Susumu; Hara, Kazumasa; and Koike, Mikio, 4,700,644, Cl. 112-255.000.

Harada, Naoki: *See*—
Kayane, Yutaka; Sawamoto, Hirokazu; Omura, Takashi; Harada, Naoki; and Takeshita, Akira, 4,701,524, Cl. 534-642.000.

Harada, Susumu: *See*—
Serizawa, Hajime; Ogihara, Keizo; Shimizu, Kiyoshi; and Harada, Susumu, 4,701,497, Cl. 525-292.000.

Harashima, Tadashi; Morita, Hideo; and Mori, Eiji, to Nissan Motor Co., Ltd. Intake control device. 4,700,676, Cl. 123-339.000.

Harata, Mitsuo: *See*—
Imai, Motomasa; Harata, Mitsuo; Takahashi, Takashi; and Nishijima, Kazuo, 4,701,767, Cl. 346-74.200.

Hardy, Christopher J.; and Dumoulin, Charles L., to General Electric Company. Polarization transfer by selective homonuclear technique for suppression of uncoupled spins in NMR spectroscopy. 4,701,708, Cl. 324-311.000.

Hareng, Michel: *See*—
Le Pesant, Jean-Pierre; Hareng, Michel; Mourey, Bruno; and Perbet, Jean-Noel, 4,701,021, Cl. 350-267.000.

Harold Simpson, Inc.: *See*—
Simpson, Harold S., 4,700,522, Cl. 52-528.000.

Harrigan, Michael E.; Durbin, John A.; and Schroll, Ross E., to Xerox Corporation. Display device with increased view angle. 4,701,027, Cl. 350-334.000.

Harris Corporation: *See*—
Campione, Ben, 4,701,644, Cl. 307-530.000.
Hankins, Kevin T.; Michael, Mark W.; Moser, Jay D.; and Rosier, Brian K., 4,701,780, Cl. 357-51.000.
Mader, James M., 4,701,860, Cl. 364-490.000.

Harris, David J.; and Vinn, Charles L., to Raytheon Company. Logic network for D/A conversion. 4,701,641, Cl. 307-445.000.

Harris, Richard L.: *See*—
Fenn, Robert W., III; Pless, Emory J.; Harris, Richard L.; and O'Leary, Kevin, 4,701,250, Cl. 204-283.000.

Harris, Robert M.; and Blomquist, Arthur G., to FMC Corporation. Submarine weapon handling system. 4,700,653, Cl. 114-316.000.

Harrison, Herold D.; and Tuten, James M., to Battelle Memorial Institute. Wheel load measurement. 4,701,866, Cl. 364-550.000.

Harrison, Luther A.: *See*—
Callegari, Stephen R., Sr.; Harrison, Luther A.; and Salsman, Robert W., Jr., 4,701,869, Cl. 364-562.000.

Harsch, Georg: *See*—
Mezger, Dieter; Harsch, Georg; and Flachenecker, Gert, 4,700,478, Cl. 30-294.000.

Harunari, Yoshihiro: *See*—
Tokuda, Ryuji; Harunari, Yoshihiro; and Kobe, Takashi, 4,701,048, Cl. 356-1.000.

Harvey, Kaye F.; Johns, Reginald B.; Buchanan, Alan S.; and Cain, David A., to University of Melbourne, The; and CRA Services Limited. Upgrading solid fuels. 4,701,184, Cl. 44-10.00D.

Harwood, J. Richard: *See*—
Wiebe, Kenneth J.; Harwood, J. Richard; and Martin, Russell J., 4,700,784, Cl. 172-126.000.

Harwood, Jon, to AP Industries, Inc. Stamp formed muffler. 4,700,806, Cl. 181-282.000.

Hasegawa, Kenji; Nakashima, Koichi; Eguchi, Tohru; and Ota, Masako, to Lederle (Japan), Ltd. Composition stably containing minocycline for treating periodontal diseases. 4,701,320, Cl. 424-54.000.

Hasegawa, Kyohei, to Nippon Seiki Co., Ltd. Protective device for spraying apparatus. 4,700,890, Cl. 239-103.000.

Hasegawa, Masakazu: *See*—
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Kaji, Isao; Hasegawa, Masakazu; Tan, Masayuki; and Kurata, Masaru, 4,701,117, Cl. 425-116.000.

Hasegawa, Masazumi; Arai, Shoji; and Mizoe, Shinya, to Toyo Soda Manufacturing Co., Ltd. Catalyst for producing polyurethane foams coated with skin. 4,701,473, Cl. 521-118.000.

Hasegawa, Norio; Fujino, Toyomi; and Matsubara, Susumu, to Sony Corporation. Disc players fitted for automatic change of discs. 4,701,900, Cl. 369-36.000.

Hashimoto, Hitoshi; Tamaki, Yoshihiro; Mikami, Kazufumi; and Shimogai, Kiyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Boring process and apparatus. 4,701,081, Cl. 408-1.00R.

Hashimoto, Masaki: *See*—
Tanaka, Takaharu; Higuchi, Naoki; Saito, Masayuki; and Hashimoto, Masaki, 4,701,210, Cl. 71-98.000.
Tanaka, Takaharu; Saitoh, Masayuki; Hashimoto, Masaki; and Higuchi, Naoki, 4,701,465, Cl. 514-423.000.

Hata, Hideo: *See*—
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,701,496, Cl. 525-240.000.

Hatch, Bruce O., to Thermal Dynamics Corporation. Spring loaded electrode exposure interlock device. 4,701,590, Cl. 219-121.0PR.

Hathaway, John M., to Kimberly-Clark Corporation. Apparatus and process for separating and removing bundles of sheets. 4,700,939, Cl. 270-39.000.

Hattori, Hiroyuki; Uemura, Takashi; and Yamauchi, Toshio, to Nissho Corporation. Device for sampling blood and measuring erythrocyte sedimentation rate. 4,701,305, Cl. 422-73.000.

Hattori, Kyo: *See*—
Sakurai, Kazuhiro; and Hattori, Kyo, 4,700,669, Cl. 123-188.00M.

Hau, Sau F.: *See*—
Clark, Adrian P.; and Hau, Sau F., 4,701,936, Cl. 375-14.000.

Hauch, Dennis W.: *See*—
Eichman, Carl E.; Gurubatham, Vincent P.; Hauch, Dennis W.; and Kinyon, Garrett K., 4,700,554, Cl. 68-17.00R.

Hauck, John D.: *See*—
Nadir, Mark; and Hauck, John D., 4,701,759, Cl. 340-825.440.

Hawkins, Wallace H.; and Gosnell, Calvin B., to Red Arrow International Inc. Anti-jackknifing control system, apparatus and method. 4,700,966, Cl. 280-432.000.

Hayakawa, Akihiko: *See*—
Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; Bingo, Hideyuki; Kazusaka, Shoji; and Konishi, Keisuke, 4,701,582, Cl. 200-61.420.

Hayama, Noriyuki: *See*—
Kawakatsu, Akira; Yuge, Yooji; Hayama, Noriyuki; Saito, Tokuyoshi; and Maeda, Umio, 4,701,663, Cl. 313-112.000.

Hayashi, Masashi: *See*—
Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, 4,701,819, Cl. 360-122.000.

Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; Bingo, Hideyuki; Kazusaka, Shoji; and Konishi, Keisuke, to Omron Tateisi Electronics Co. Plunger sensing switch. 4,701,582, Cl. 200-61.420.

Hayashi, Takeshi. Method for instantly killing and cooling fish, and an apparatus for carrying out this method. 4,700,547, Cl. 62-65.000.

Hayashi, Terumine: *See*—
Kuboki, Shigeo; Masuda, Ikuro; Masuda, Toshiaki; and Hayashi, Terumine, 4,701,922, Cl. 371-25.000.

Hayashi, Yasutaka: *See*—
Doi, Shunichi; Sugiura, Noboru; Hayashi, Yasutaka; and Yamamoto, Yuzo, 4,700,971, Cl. 280-707.000.
Miki, Kazuo; Hayashi, Yasutaka; Fukui, Katsuhiko; and Sumi, Kazumasa, 4,700,960, Cl. 280-91.000.

Hayashi, Yoshimasa; Minezaki, Yutaka; Ito, Yoji; Inoue, Naoyuki; and Hirano, Yoshinori, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,700,664, Cl. 123-41.270.

Hazard, James T. Face shield device. 4,701,129, Cl. 433-136.000.

Head, Glenn D., Jr.; and Postal, Jeffrey J., to Deere & Company. Pivoting spring-cushioned press wheel gang assembly. 4,700,641, Cl. 111-85.000.

Head, W. John; and Watson, Francis M., to Honeywell Inc. Compensated light sensor system. 4,701,669, Cl. 315-155.000.

Health and Home Products: *See*—
Widinski, Paul R.; and Taylor, Glenn N., 4,700,943, Cl. 272-96.000.

Heatwole, Richard L. Amusement and/or exercising device. 4,700,947, Cl. 272-146.000.

Heckler, Jay W., to Upjohn Company, The. Treatment of Type II Herpes virus with ibuprofen. 4,701,470, Cl. 514-570.000.

Heffner, Thomas G.: *See*—
Dewald, Horace A.; Wise, Lawrence D.; and Heffner, Thomas G., 4,701,456, Cl. 514-253.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Fatty esters of alkanolamine hydroxyalkylates as oxidized coal conditioner in froth flotation process. 4,701,257, Cl. 209-166.000.

Heine, William M., to Atlantic Research Corporation. Fiber spool apparatus. 4,700,607, Cl. 87-57.000.

Heinen, Walter, to Alfred H. Schutte, Firma. Multi-spindle automatic lathe. 4,700,594, Cl. 82-3.000.

Heitzig, Jurgen: *See*—
Eberhard, Gunter; and Heitzig, Jurgen, 4,700,931, Cl. 267-35.000.

Heller, Ava. Eyebrow trimmer. 4,700,477, Cl. 30-51.000.

Henderson, Richard S.; Shreve, Gary A.; and Tenhover, Michael A., to Standard Oil Company, The. Corrosion resistant amorphous chromium-metalloid alloy compositions. 4,701,226, Cl. 148-403.000.

Henderson, Robert W., to Rodney Hunt Company. Slide gate. 4,700,927, Cl. 251-158.000.

Hendricks, Daniel A.: *See*—
Shemeta, Paul J.; and Hendricks, Daniel A., 4,700,471, Cl. 29-809.000.

Hendricks, Udo W.; and Schmidt, Adolf, to Bayer Aktiengesellschaft. Branched sulfosuccinamic acid emulsifiers for the production of particularly shear-stable despersions. 4,701,284, Cl. 260-513.00N.

Henke, Mitchell C.: *See*—
Bratton, Ronald E.; Gigandet, Richard W.; Henke, Mitchell C.; Kaminski, Daniel S.; and Wibel, Michelle A., 4,701,340, Cl. 426-511.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Kittscher, Peter; and Buecheler, Herbert, 4,700,857, Cl. 215-232.000.

Henmi, Yoshiyasu; Terada, Takashi; Suzuki, Masaru; and Ninomiya, Hiroshi, to Nippon Kayaku Kabushiki Kaisha. Etoposide soft capsules. 4,701,327, Cl. 424-455.000.

Henn, Stefan, to Robert Krups Stiftung & Co. KG. Food processor with adapters for transmission of torque to rotary tools. 4,700,903, Cl. 241-101.200.

Henneberg, Peter: *See*—
Hager, Karl-Heinz; Henneberg, Peter; and Juranek, Hans-Joachim, 4,701,023, Cl. 350-321.000.

Henschel, Claude: *See*—
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,701,356, Cl. 427-423.000.
Bose, Debasis; Datta, Amitava; DeCristofaro, Nicholas J.; and Henschel, Claude, 4,701,357, Cl. 427-423.000.

Hensley, Donald E.: *See*—
Smith, Michael L.; and Hensley, Donald E., 4,700,778, Cl. 166-250.000.

Hercules Incorporated: *See*—
Daughenbaugh, Norman E., Jr., 4,701,517, Cl. 528-205.000.

Hermann, Dietmar; and Walter, Siegfried, to Continental Gummi-Werke Aktiengesellschaft. Profiled strip for sealingly bordering window or door openings in motor vehicles and buildings. 4,701,376, Cl. 428-358.000.

Hermann Heye: *See*—
Schneider, Wilhelm, 4,701,203, Cl. 65-265.000.

Herold, Thomas: *See*—
Merrem, Hans J.; Klug, Rudolf; and Herold, Thomas, 4,701,300, Cl. 430-196.000.

Herrero, Maria P.: *See*—
Rogers, Richard B.; and Herrero, Maria P., 4,701,207, Cl. 71-92.000.
Rogers, Richard B.; and Herrero, Maria P., 4,701,463, Cl. 514-333.000.

Hess, Stanley C., to American Recreation Group. Bicycle pivot assembly. 4,700,964, Cl. 280-289.00R.

Hetherington, Michael W., to Iona Appliances Inc./Appareils Iona Inc. Hose assembly for fluid flow apparatus. 4,700,428, Cl. 15-338.000.

Hewlett-Packard Company: *See*—
Savord, Bernard J., 4,700,573, Cl. 73-625.000.
Takagi, Susumu, 4,701,701, Cl. 324-158.00R.

Hickernell, Fred S.: *See*—
Richard, Fred V.; Hickernell, Fred S.; and Cho, Frederick Y., 4,701,008, Cl. 350-96.120.

Hickmann, Udo; and Ruehle, Guenter, to Dr. Ing. H.c.f. Porsche AG. Torque transfer device and engageable, shiftable clutch in an all-wheel drive arrangement for a motor vehicle. 4,700,820, Cl. 192-48.500.

Hicks, Raymond J., to Hicks Transmissions Limited. Gear mounting. 4,700,583, Cl. 74-410.000.

Hicks Transmissions Limited: *See*—
Hicks, Raymond J., 4,700,583, Cl. 74-410.000.

Higashi, Gregg S., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method for growing patterned metal layers. 4,701,347, Cl. 437-246.000.

Hight, Margaret A.: *See*—
Huang, Wann-Sheng; and Hight, Margaret A., 4,700,779, Cl. 166-263.000.

Higuchi, Naoki: *See*—
Tanaka, Takaharu; Higuchi, Naoki; Saito, Masayuki; and Hashimoto, Masaki, 4,701,210, Cl. 71-98.000.
Tanaka, Takaharu; Saitoh, Masayuki; Hashimoto, Masaki; and Higuchi, Naoki, 4,701,465, Cl. 514-423.000.

Hihn, Gerhard: *See*—
Stoll, Kurt; and Hihn, Gerhard, 4,700,616, Cl. 92-118.000.

Hildebrandt, Paul R.; and Pelletier, Marc G. Geometric modeling kit and method of making same. 4,701,131, Cl. 434-211.000.

Hill, John; Bannister, Royston W.; and Turczanski, Henry, to Standex Electronics (U.K.) Limited. Bobbins for electrical coils and method of manufacturing electrical coils therefrom. 4,701,735, Cl. 335-282.000.

Hill, Leslie C.: *See*—
McGhee, James B.; Egan, Joseph W.; and Hill, Leslie C., 4,700,886, Cl. 236-25.00R.

Hilti Aktiengesellschaft: *See*—
Deutschenbaur, Paul; Rupprecht, Hans; Burtscher, Norbert; and Nigg, Berno, 4,701,083, Cl. 408-240.000.

Hinderstein, Philip M.: *See*—
Malloy, James T., 4,701,703, Cl. 324-158.00F.

Hines, Gordon E., to Hines Industries, Inc. Driveshaft fabricating apparatus. 4,700,439, Cl. 29-33.00T.

Hines, Gordon E., to Hines Industries, Inc. Hard static balancing machine. 4,700,570, Cl. 73-483.000.

Hines Industries, Inc.: *See*—
Hines, Gordon E., 4,700,439, Cl. 29-33.00T.
Hines, Gordon E., 4,700,570, Cl. 73-483.000.

Hintermann, Hans E.: *See*—
Sarin, Vinod K.; and Hintermann, Hans E., 4,701,384, Cl. 428-688.000.

Hirakura, Koji; and Ikesue, Masumi, to Ricoh Co., Ltd. Developing unit of dry type. 4,700,659, Cl. 118-652.000.

Hiramatsu, Soichi, to Canon Kabushiki Kaisha. Thermal head. 4,701,593, Cl. 219-216.000.

Hirano, Hiroyuki: *See*—
Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, 4,701,902, Cl. 369-77.100.

Hirano, Seiji; and Sato, Youji, to Mazda Motor Corporation; and Nifco Inc. Cable holder for use in a vehicle body. 4,700,913, Cl. 248-73.000.

Hirano, Tatsuo: *See*—
Wada, Toshio; and Hirano, Tatsuo, 4,701,576, Cl. 174-117.00F.

Hirano, Yoshinori: *See*—
Hayashi, Yoshimasa; Minezaki, Yutaka; Ito, Yoji; Inoue, Naoyuki; and Hirano, Yoshinori, 4,700,664, Cl. 123-41.270.

Hirasato, Bunji: *See*—
Mitsukuchi, Kunio; Ito, Hiromitsu; Eguchi, Isamu; Hirasato, Bunji; and Furuhata, Takashi, 4,701,583, Cl. 200-148.00B.

Hirasawa, Kazuhiro: *See*—
Yamamoto, Junko; Fujimoto, Kyohei; Hirasawa, Kazuhiro; and Kuboyama, Haruhiro, 4,701,763, Cl. 343-700.0MS.

Hirose Manufacturing Company, Ltd.: *See*—
Hirose, Tokuzo; and Shimizu, Hiromitsu, 4,700,643, Cl. 112-231.000.

Hirose, Ryusho, to Canon Kabushiki Kaisha. Reflection optical system. 4,701,035, Cl. 350-505.000.

Hirose, Tokuzo; and Shimizu, Hiromitsu, to Hirose Manufacturing Company, Ltd. Rotary hook. 4,700,643, Cl. 112-231.000.

Hirotsu, Tetsuji; Kiwaki, Hisakatsu; Nakamura, Kiyoshi; Narita, Hiroshi; Kasai, Syozi; Kimura, Akira; and Tsutsui, Yoshio, to Hitachi, Ltd. Control system for maintaining traction of rolling stock. 4,701,682, Cl. 318-52.000.

Hishinuma, Toru: *See*—
Toyoda, Kenji; and Hishinuma, Toru, 4,701,804, Cl. 358-280.000.

Hitachi Cable Ltd.: *See*—
Okamoto, Kunihiko, 4,701,730, Cl. 333-237.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Oku, Kentaro; Fukushima, Masakazu; Suzuki, Hitomi; and Maruyama, Masanori, 4,701,668, Cl. 315-17.000.

Hitachi Engineering Co., Ltd.: *See*—
Kuboki, Shigeo; Masuda, Ikuro; Masuda, Toshiaki; and Hayashi, Terumine, 4,701,922, Cl. 371-25.000.

Hitachi, Ltd.: *See*—
Aoki, Masakazu; Horiguchi, Masashi; Nakagome, Yoshinobu; Ikenaga, Shinichi; Shimohigashi, Katsuhiro; Masuhara, Toshiaki; Itoh, Kiyoo; Nakamura, Hideo; and Minato, Osamu, 4,701,884, Cl. 365-189.000.
Endo, Shyusuke; Aoyama, Naofumi; Yabuuchi, Toshihiko; Sakuma, Toshiyuki; and Kinugawa, Kiyoshige, 4,701,025, Cl. 350-333.000.
Hirotsu, Tetsuji; Kiwaki, Hisakatsu; Nakamura, Kiyoshi; Narita, Hiroshi; Kasai, Syozi; Kimura, Akira; and Tsutsui, Yoshio, 4,701,682, Cl. 318-52.000.
Imura, Ryo; Ikeda, Tadashi; and Sugita, Yutaka, 4,701,385, Cl. 428-693.000.
Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, 4,701,819, Cl. 360-122.000.
Koyanagi, Mitsumasa; and Kaneko, Hiroko, 4,701,349, Cl. 427-93.000.
Kuboki, Shigeo; Masuda, Ikuro; Masuda, Toshiaki; and Hayashi, Terumine, 4,701,922, Cl. 371-25.000.
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,701,608, Cl. 250-205.000.
Naka, Hiroshi; Seko, Ichiro; Kobayashi, Shuji; and Haneda, Makoto, 4,701,927, Cl. 372-46.000.
Okada, Daisuke; Uchida, Akihisa; Takakura, Toshihiko; Nakashima, Shinji; Ohno, Nobuhiko; and Ogiue, Katsumi, 4,700,464, Cl. 437-67.000.
Oku, Kentaro; Fukushima, Masakazu; Suzuki, Hitomi; and Maruyama, Masanori, 4,701,668, Cl. 315-17.000.
Okumura, Masahide; Matsuzaka, Takashi; Matsuoka, Genya; and Saitou, Norio, 4,701,620, Cl. 250-398.000.
Oshida, Yoshitada; Shiba, Masataka; Nakashima, Naoto; Nakata, Toshihiko; and Uto, Sachio, 4,701,050, Cl. 356-152.000.
Sakakibara, Yasuhiro; Kobayashi, Isamu; and Suzuki, Yoshinori, 4,701,886, Cl. 365-189.000.
Satou, Kazuhiro; Kudo, Koji; Maruyama, Masanori; Mimura, Itaru; and Nagahara, Shusaku, 4,701,679, Cl. 315-383.000.
Soda, Yasunari; Mochiji, Kozo; Kimura, Takeshi; and Obayashyi, Hidehito, 4,701,940, Cl. 378-34.000.
Yamamoto, Etsuji; Kohno, Hideki; and Takeda, Ryuzaburo, 4,701,709, Cl. 324-312.000.

Hitachi Maxell, Ltd.: *See*—
Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, 4,701,819, Cl. 360-122.000.

Hitachi Maxwell, Ltd.: *See*—
Aoyama, Shigeo; and Yamamoto, Yoshinori, 4,701,371, Cl. 428-323.000.

Hitachi Metals, LTD.: *See*—
Wyman, John E., 4,701,276, Cl. 252-62.520.

Hitachi Microcomputer Engineering, Ltd.: *See*—
Okada, Daisuke; Uchida, Akihisa; Takakura, Toshihiko; Nakashima, Shinji; Ohno, Nobuhiko; and Ogiue, Katsumi, 4,700,464, Cl. 437-67.000.
Sakakibara, Yasuhiro; Kobayashi, Isamu; and Suzuki, Yoshinori, 4,701,886, Cl. 365-189.000.

Hitachi Tokyo Electronics Co., Ltd.: *See*—
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,701,608, Cl. 250-205.000.

Hlavach, Mark C., to Chrysler Motors Corporation. Movable molding for a vehicle. 4,700,977, Cl. 293-126.000.

Hobbins, Martin E.; Dickie, Robert G.; and Pardo, Rene, to Northern Technologies Ltd. Conductive screen for video display unit. 4,701,801, Cl. 353-245.000.

Hochtemperatur-Reaktorbau GmbH: *See*—
Schoening, Josef; Wachholz, Winfried; and Weicht, Ulrich, 4,701,298, Cl. 376-273.000.

Hoda, Masakazu: *See*—
Nishiguchi, Yasuo; Minami, Keijirou; and Hoda, Masakazu, 4,701,769, Cl. 346-76.0PH.

Hodges, Steven E.: *See*—
Kern, Mark T.; Hodges, Steven E.; Snider, Danny G.; and Shamordola, Kenneth A., 4,701,624, Cl. 250-554.000.

Hoechst Aktiengesellschaft: *See*—
Fuchs, Fritz-Reichard; and Staendeke, Horst, 4,701,373, Cl. 428-326.000.
Grau, Ulrich, 4,701,440, Cl. 514-3.000.
Limbert, Michael; Durckheimer, Walter; Schorlemmer, Hans-Ulrich; and Dickneite, Gerhard, 4,701,452, Cl. 514-206.000.

Hoerbiger Ventilwerke Aktiengesellschaft: *See*—
Bauer, Friedrich; and Kuhnelt, Herbert, 4,700,610, Cl. 91-390.000.

Hoff, Terry E., to General Telephone Company of Indiana. Telephone station testing apparatus. 4,701,699, Cl. 324-133.000.

Hoffa, Jack L.; and Karkar, Maurice N., to American Hospital Supply Corporation. Calibration cell for calibration of gaseous or non-gaseous fluid constituent sensors. 4,700,560, Cl. 73-1.00G.

Hoffman, Kent C., to Murray Electronics Associates Limited Partnership. Apertured adhesively applied body electrode apparatus and method. 4,700,710, Cl. 128-641.000.

Hoffmann-La Roche Inc.: *See*—
Lukac, Teodor; Soukup, Milan; and Widmer, Erich, 4,701,540, Cl. 549-341.000.

Hoffmann, Ronald C.: *See*—
Searcy, James A.; Zoellner, Roger O.; and Hoffmann, Ronald C., 4,700,688, Cl. 126-299.00D.

Hofman, Manfred: *See*—
Andra, Rainer; and Hofman, Manfred, 4,700,934, Cl. 267-140.100.

Hofmeister, Helmut: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Toepert, Michael; and Wendt, Hans, 4,701,451, Cl. 514-180.000.

Holbrook, James H. Adjustable pedestal for boat seats. 4,700,921, Cl. 248-421.000.

Holdsworth, Timothy M., to Northeast Filter Co., Inc. Trap filter assembly. 4,701,726, Cl. 333-185.000.

Hollenstein, Helmut: *See*—
Rock, Erich; and Hollenstein, Helmut, 4,700,994, Cl. 312-330.00R.

Holmsen, Theodpre W.: *See*—
Dunbar, Joseph E.; Holmsen, Theodore W.; and Senkbeil, Herman O., 4,701,211, Cl. 71-121.000.

Holstedt, Richard A.: *See*—
Croudace, Michael C.; Mendelson, Leah T.; and Holstedt, Richard A., 4,701,274, Cl. 252-46.300.

Homma, Shirou; Izumi, Takashi; and Murakami, Sakae, to Mitsui Sekiyu Kagaku Kogyo Kabushiki Kaisha. Solvent soluble fluorine-containing polymer, coating composition containing the same and coating process thereof. 4,701,508, Cl. 526-249.000.

Honda Giken Kogyo K.K.: *See*—
Iwata, Takahiro, 4,700,674, Cl. 123-327.000.
Otobe, Yutaka; Kato, Akira; and Chikamatsu, Masataka, 4,700,675, Cl. 123-339.000.
Otobe, Yutaka; Kato, Akira; Hosoda, Fumio; and Takagi, Akinobu, 4,700,679, Cl. 123-327.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hashimoto, Hitoshi; Tamaki, Yoshihiro; Mikami, Kazufumi; and Shimogai, Kiyoshi, 4,701,081, Cl. 408-1.00R.
Kawano, Akio, 4,700,799, Cl. 180-219.000.
Kawasaki, Kazuhiro; and Muranaka, Akio, 4,700,411, Cl. 2-425.000.
Kumasaka, Toru; Ohya, Toshikazu; and Kamiji, Koichi, 4,701,628, Cl. 307-9.000.
Nishikawa, Masao; Miyake, Junichi; Sakurai, Yoshimi; and Fukuda, Yukihiro, 4,700,819, Cl. 192-3.620.
Saito, Kaoru; Noji, Akio; Kakuta, Yonehiro; and Takigawa, Koichi, 4,700,479, Cl. 33-366.000.
Yashima, Michio; and Takahashi, Shuji, 4,700,795, Cl. 180-68.500.

Honemann, Rudolf: *See*—
Maucher, Paul; and Honemann, Rudolf, 4,700,821, Cl. 192-106.200.
Maucher, Paul; and Honemann, Rudolf, 4,700,822, Cl. 192-106.200.

Honeywell Inc.: *See*—
Boebert, William E.; and Kain, Richard Y., 4,701,840, Cl. 364-200.000.
Head, W. John; and Watson, Francis M., 4,701,669, Cl. 315-155.000.

Honeywell Information Systems Inc.: *See*—
Bruce, Kenneth E., 4,701,863, Cl. 364-518.000.

Hongo, Yasuo, to Fuji Electric Company, Ltd. Character identifying apparatus. 4,701,961, Cl. 382-34.000.

Hoogenboom, Leo, to Mechanical Technology Incorporated. Fiber optic proximity sensors for narrow targets with reflectivity compensation. 4,701,610, Cl. 250-227.000.

Hoops, John F.: *See*—
Donaldson, Richard E.; and Hoops, John F., 4,701,541, Cl. 549-440.000.

Horiguchi, Masashi: *See*—
Aoki, Masakazu; Horiguchi, Masashi; Nakagome, Yoshinobu; Ikenaga, Shinichi; Shimohigashi, Katsuhiro; Masuhara, Toshiaki; Itoh, Kiyoo; Nakamura, Hideo; and Minato, Osamu, 4,701,884, Cl. 365-189.000.

Horii, Satoshi; Kameda, Yukihiko; and Fukase, Hiroshi, to Takeda Chemical Industries, Inc. N-substituted pseudo-aminosugars, their production and use. 4,701,559, Cl. 564-363.000.

Horinek, Herbert J.: *See*—
Berryman, Leslie N.; Davis, Gail F.; and Horinek, Herbert J., 4,701,095, Cl. 414-332.000.

Horiuchi, Tatsumi; Kasahara, Seitaro; and Sawaki, Akira, to Konishiroku Photo Ind. Co., Ltd. Image recording apparatus for composing plural partial original images into a single composite image. 4,701,044, Cl. 355-7.000.

Horlander, Frank J., to International Business Machines Corporation. Method and apparatus for controlling print quality of a thermal printer. 4,701,836, Cl. 346-76.0PH.

Horn, John, to Lear Siegler, Inc. Glider support assembly. 4,700,920, Cl. 248-370.000.

Horn, Marcus J.; and Miller, William K., to Applied Protein Technologies, Inc. Apparatus for automated synthesis of peptides. 4,701,304, Cl. 422-62.000.

Horsewell, Henry G.; and Duke, Martin G., to British-American Tobacco Company Limited. Smoking-articles mouthpieces-elements. 4,700,724, Cl. 131-336.000.

Hoshi, Tai: *See*—
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,701,608, Cl. 250-205.000.

Hoshino Gakki Co., Ltd.: *See*—
Hoshino, Yoshihiro, 4,700,437, Cl. 24-456.000.

Hoshino, Yoshihiro, to Hoshino Gakki Co., Ltd. Lever lock clamp. 4,700,437, Cl. 24-456.000.

Hosoda, Fumio: *See*—
Otobe, Yutaka; Kato, Akira; Hosoda, Fumio; and Takagi, Akinobu, 4,700,679, Cl. 123-327.000.

Hotta, Hisashi: *See*—
Kitamura, Yoichi; Hotta, Hisashi; and Kodaira, Toshimasa, 4,701,354, Cl. 427-255.600.

Hotta, Yasunari: *See*—
Akiyama, Takashi; Hotta, Yasunari; and Oda, Naonobu, 4,701,372, Cl. 428-323.000.

Hotz, Jean-Marie: *See*—
Mock, Elmar; and Hotz, Jean-Marie, 4,700,874, Cl. 224-178.000.

Houminer, Yoram: *See*—
Chan, W. Geoffrey; and Houminer, Yoram, 4,701,282, Cl. 260-410.90R.

Howard, Christian S.: *See*—
Lachenmeier, Timothy T.; and Howard, Christian S., 4,700,951, Cl. 273-264.000.

Howard, Scott P.; Kozlowski, Ted A.; and Retzer, Michael H., to Motorola, Inc. Signalling system for trunked private calls. 4,701,944, Cl. 379-63.000.

Howell, Kenneth L.: *See*—
Bailey, Robert L.; and Howell, Kenneth L., 4,700,687, Cl. 126-121.000.

Hrehovcik, Michael: *See*—
Morgan, Tamara M.; Roig, Richard R.; and Hrehovcik, Michael, 4,700,850, Cl. 211-131.000.

Hsu, Joseph C.; and Guckenberger, Anthony C., to American Can Company. Method of forming a package having strong seals and a modified ply-separation opening. 4,700,531, Cl. 53-412.000.

Hsu, Wen-Liang, to Goodyear Tire & Rubber Company, The. Separation of aldehydes from ketones via acid-catalyzed cyclotrimerization of the aldehyde. 4,701,561, Cl. 568-492.000.

Huang, An S.: *See*—
Softly, Billy J.; and Huang, An S., 4,701,336, Cl. 426-538.000.

Huang, Wann-Sheng; and Hight, Margaret A., to Texaco Inc. Parallel horizontal wells. 4,700,779, Cl. 166-263.000.

Huazhong Institute of Technology: *See*—
Yuan, Ren; Xianzhi, Chen; Yuanxi, Feng; Guojiu, Li; Dake, Huang; Yongli, Zhang; and Quanzhong, Sun, 4,701,689, Cl. 322-19.000.

Hudgens, Stephen J.: *See*—
Ovshinsky, Stanford R.; Allred, David D.; Walter, Lee; and Hudgens, Stephen J., 4,701,343, Cl. 427-39.000.

Hudon, James D.: *See*—
Scarano, Robert V.; and Hudon, James D., 4,701,242, Cl. 162-275.000.

Hughes Aircraft Company: *See*—
Beaubien, Randall S.; and Erps, Lorri A., 4,700,462, Cl. 437-187.000.
Hanson, Allan W.; and Christiansen, Theron L., 4,701,731, Cl. 333-257.000.
MacPherson, Duncan, 4,701,791, Cl. 358-109.000.
Nestlerode, C. Dale, 4,701,732, Cl. 334-56.000.
Schaefer, Robert D.; and Kiunke, Paul C., 4,701,602, Cl. 250-201.000.
Tangonan, Gregory L.; and Yen, Huan-Wun, 4,701,009, Cl. 350-96.120.

Hughes, Michael P.; and Pellon, Brian J., to El Paso Products Company. Process for the production of stable noncorrosive amorphous polyalphaolefins. 4,701,489, Cl. 524-349.000.

Humber, Leslie G.: *See*—
Mobilio, Dominick; Demerson, Christopher A.; and Humber, Leslie G., 4,701,533, Cl. 548-439.000.

Humphreys, Paula L.; Dietsche, Thomas J.; and Bixby, James L., to Dow Chemical Company, The. Method of selectively chlorinating 2-chloro-5-(trichloromethyl) pyridine in the 3-position. 4,701,532, Cl. 546-345.000.

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Shimirak, Gerlad L.; Hunter, Thomas; Story, Martha F.; Halstead, W. G.; Chan, Paul S.; and Swinmurn, Christopher J., 4,701,574, Cl. 174-93.000.

Hurtado, Juan: *See*—
Garcia, Juan J.; Galiasso, Roberto E.; Ramirez de Agudelo, Magdalena M.; Rivas, Luis; and Hurtado, Juan, 4,701,435, Cl. 502-252.000.

Husky Injection Molding Systems Ltd.: *See*—
Valyi, Emery I., 4,701,292, Cl. 264-255.000.

Hussain, Zubair: *See*—
Andreasen, David A.; Buggert, Jerrold E.; Desai, Harshad K.; and Hussain, Zubair, 4,701,845, Cl. 364-200.000.

Hutchison, Thomas M.: *See*—
Burns, Steve; Hutchison, Thomas M.; and Dertian, Henry H., 4,700,963, Cl. 280-276.000.

Hvezda, Jaroslav M.; Velsher, Benne; and Middlehurst, Richard J., to Northern Telecom Limited. Multiple contact connector having a low insertion force. 4,700,998, Cl. 439-325.000.

Hwang, Yin-Chao: *See*—
Powell, Theo J.; and Hwang, Yin-Chao, 4,701,921, Cl. 371-25.000.

Hycrude Corporation: *See*—
Janka, John C.; Schora, Frank C.; and Knowlton, Ted M., 4,701,266, Cl. 210-803.000.

Hyde, Raymond G.: *See*—
Kitchens, Judith F.; Culp, Carl H., Sr.; Hyde, Raymond G.; and Brownlee, Shirley G., 4,701,125, Cl. 432-1.000.

Hymac Ltd.: *See*—
Rowland, Stephen A., 4,700,900, Cl. 241-37.000.

I-Flow Corporation: *See*—
Brown, Eric W.; and Tai, Henry T., 4,701,159, Cl. 604-43.000.

Ichihara, Katsutarou, to Kabushiki Kaisha Toshiba. Optical system for recording/reproducing information by means of a dielectric breakdown effected by photoswitching of a bias-voltage. 4,701,880, Cl. 365-106.000.

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Okutsu, Hideo; Mikami, Koushirou; Yonezawa, Kazuyoshi; and Ichikawa, Kuniharu, 4,701,595, Cl. 219-364.000.

Ichikawa, Osamu: *See*—
Saito, Yasunori; Ichikawa, Osamu; and Oshima, Toshio, 4,701,015, Cl. 350-96.230.

Ichikawa Wollen Textile Co., Ltd.: *See*—
Kiuchi, Masao; Ito, Yoshiaki; Ishibashi, Nobuyuki; and Yamada, Kazuo, 4,701,368, Cl. 428-233.000.
ICI Americas Inc.: *See*—
Nelson, Richard V.; and Stephen, John F., 4,701,485, Cl. 524-98.000.
Ida, Masatoshi, to Olympus Optical Co., Ltd. Apparatus and method for detecting focus condition of an imaging optical system. 4,701,605, Cl. 250-201.000.
Ida, Mitsuru, to Sony Corporation. Capstan friction drive apparatus of tape recorder. 4,701,816, Cl. 360-96.400.
Ide, Manabu, to Kabushiki Kaisha Aideie. Attaching method for shell-type milling cutter. 4,701,084, Cl. 409-131.000.
Iden, Marlin D.: *See*—
Kramer, Melvin G.; and Iden, Marlin D., 4,700,490, Cl. 33-355.00D.
Igarashi, Sadao, to Alps Electric Co., Ltd. Waveguide filter. 4,701,728, Cl. 333-212.000.
IHC Holland N.V.: *See*—
Arentsen, Dik, 4,701,077, Cl. 405-232.000.
Iida, Tetsuya: *See*—
Sahoda, Masayuki; Tanaka, Fuminari; and Iida, Tetsuya, 4,701,877, Cl. 364-784.000.
Iijima, Takeo, to Diesel Kiki Co., Ltd. Swash-plate type rotary compressor with drive shaft, lubrication. 4,701,110, Cl. 417-269.000.
Iijima, Toshifumi; Yamada, Yoshitaka; Kumashiro, Kenji; Kamio, Takashi; and Shimura, Shinya, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material of high sensitivity and improved granularity. 4,701,404, Cl. 430-559.000.
Iizuka, Jiro: *See*—
Shimizu, Shigemi; and Iizuka, Jiro, 4,701,115, Cl. 418-55.000.
Ikeda, Hidekatsu; Morikawa, Hiroyuki; and Yoshie, Yasunori, to Amada Company, Limited. Tapping machine. 4,700,441, Cl. 29-33.00P.
Ikeda, Kazuhiko; and Kawamura, Makoto, to Panafacom Limited. Computer system capable of interruption using special protection code for write interruption region of memory device. 4,701,846, Cl. 364-200.000.
Ikeda, Kunihiko, to Canon Kabushiki Kaisha. Ink jet recorder having an ink acceptor with an ink absorber provided therein. 4,701,771, Cl. 346-140.00R.
Ikeda, Masami: *See*—
Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, 4,701,766, Cl. 346-1.100.
Ikeda, Mitsushi: *See*—
Suzuki, Kouji; Ikeda, Mitsushi; and Aoki, Toshio, 4,700,458, Cl. 437-83.000.
Ikeda, Tadashi: *See*—
Imura, Ryo; Ikeda, Tadashi; and Sugita, Yutaka, 4,701,385, Cl. 428-693.000.
Ikeda, Toshio, to Canon Kabushiki Kaisha. Network system utilizing plural station addresses. 4,701,908, Cl. 370-85.000.
Ikeda, Yukihiro: *See*—
Arakawa, Tatsumi; Ozaki, Masaru; and Ikeda, Yukihiro, 4,701,317, Cl. 423-445.000.
Ikegami Tsushinki Co., Ltd.: *See*—
Akimoto, Taizo; and Nagai, Asaki, 4,701,800, Cl. 358-244.000.
Ikemoto, Yoshihiro; Kataoka, Jiro; Otsuki, Toshinori; and Nakamura, Takuji, to Matsushita Electric Industrial Co. Ltd. Facsimile apparatus. 4,701,810, Cl. 358-296.000.
Ikenaga, Osamu, to Tokyo Shibaura Denki Kabushiki Kaisha. Mark position detecting method and apparatus. 4,701,053, Cl. 356-375.000.
Ikenaga, Shinichi: *See*—
Aoki, Masakazu; Horiguchi, Masashi; Nakagome, Yoshinobu; Ikenaga, Shinichi; Shimohigashi, Katsuhiro; Masuhara, Toshiaki; Itoh, Kiyoo; Nakamura, Hideo; and Minato, Osamu, 4,701,884, Cl. 365-189.000.
Ikesue, Masumi: *See*—
Hirakura, Koji; and Ikesue, Masumi, 4,700,659, Cl. 118-652.000.
Ilpea S.p.A.: *See*—
Merla, Adriano, 4,700,509, Cl. 49-487.000.
Ilyasova, Nelli I.: *See*—
Martyshenko, Jury P.; Martyshenko, Sergei J.; Kotelnikov, Jury S.; Kutukhtin, Evgeny G.; Ilyasova, Nelli I.; Volkov, Jury S.; Vardanian, Armenak M.; and Petrosian, Misha S., 4,701,075, Cl. 405-217.000.
Imai, Motomasa; Harata, Mitsuo; Takahashi, Takashi; and Nishijima, Kazuo, to Kabushiki Kaisha Toshiba. Magnetic recording head and method for manufacturing. 4,701,767, Cl. 346-74.200.
Imai, Nobuo, to Sanyo Electric Co., Ltd. Disc player. 4,701,901, Cl. 369-75.200.
Imaizumi, Haruo: *See*—
Suzuki, Hirosuke; and Imaizumi, Haruo, 4,701,362, Cl. 428-131.000.
Imakoshi, Shigeyoshi: *See*—
Yada, Hiroaki; Imakoshi, Shigeyoshi; Suyama, Hideo; Sekiya, Tetsuo; and Nakayama, Masayuki, 4,701,815, Cl. 360-77.000.
Imamura, Nobutake: *See*—
Tanaka, Fujio; and Imamura, Nobutake, 4,701,881, Cl. 365-122.000.
Imperial Chemical Industries PLC: *See*—
Loftus, Frank, 4,701,556, Cl. 564-106.000.
Nelson, Charles R.; and Thomas, Hugh, 4,701,268, Cl. 252-8.800.
Imura, Ryo; Ikeda, Tadashi; and Sugita, Yutaka, to Hitachi, Ltd. Ion-implanted magnetic bubble device and a method of manufacturing the same. 4,701,385, Cl. 428-693.000.
Inaba, Shigeru: *See*—
Nakano, Sadao; and Inaba, Shigeru, 4,701,734, Cl. 335-128.000.
Inada, Toshio: *See*—
Yamanashi, Hidenori; Inada, Toshio; and Wakabayashi, Seiichi, 4,701,662, Cl. 313-51.000.
Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, to Hitachi Maxell, Ltd.; and Hitachi, Ltd. Magnetic head to effect high density magnetic recording. 4,701,819, Cl. 360-122.000.
Index-Werke Komm.-Ges. Hahn & Tessky: *See*—
Lahm, Heinrich, 4,700,442, Cl. 29-39.000.
Industrial Electric Heating, Inc.: *See*—
Rylicki, Edward J., 4,701,584, Cl. 219-10.570.
Industrial Technology Research Institute Republic of China: *See*—
Wan, Shyue-Yun; Guo, Jeng-Joung; and Lin, Cheng-Fung, 4,701,937, Cl. 375-25.000.
Inge, Claes; Lagerstedt, Torgny; Borgstroem, Leonard; Carlsson, Claes-Goeran; Naebo, Sven-Olof; Moberg, Hans; and Franzen, Peter, to Alfa-Laval Separation AB. Centrifugal separator. 4,701,158, Cl. 494-74.000.
Injectall Limited: *See*—
Bates, Kenneth W.; and Griffiths, William A., 4,701,215, Cl. 75-53.000.
Inoue, Eiichi; Shimizu, Isamu; and Komatsu, Toshiyuki, to Canon Kabushiki Kaisha. Image forming member for elecrophotography. 4,701,394, Cl. 430-57.000.
Inoue, Naoyuki: *See*—
Hayashi, Yoshimasa; Minezaki, Yutaka; Ito, Yoji; Inoue, Naoyuki; and Hirano, Yoshinori, 4,700,664, Cl. 123-41.270.
Inoue, Satoru: *See*—
Kawazoe, Akio; and Inoue, Satoru, 4,701,635, Cl. 307-270.000.
Institut de Recherches de la Sidergie Francaise Irsid: *See*—
de Lassat de Pressigny, Yann; and Schneider, Michel, 4,700,930, Cl. 266-267.000.
Intamin AG: *See*—
Schmutz, Bernard P., 4,700,632, Cl. 104-63.000.
Intel Corporation: *See*—
Baerg, William; Ting, Chiu H.; Siu, Byron B.; and Tzeng, J. C., 4,700,454, Cl. 437-24.000.
International Business Machines Corp.: *See*—
Annunziata, Eugene J.; Faress, James M., II; and Stammely, Thomas E., 4,701,630, Cl. 307-112.000.
Bass, Vance R.; Bonebrake, Veronica A.; Garrison, David A.; Landis, James K.; Neff, Mary S.; Urquhart, Robert J.; and Williams, Susan C., 4,701,851, Cl. 364-419.000.
David, Lawrence D., 4,701,314, Cl. 423-311.000.
Horlander, Frank J., 4,701,836, Cl. 346-76.0PH.
Jackson, Robert L., 4,701,351, Cl. 427-98.000.
Olnowich, Howard T., 4,701,842, Cl. 364-200.000.
Piro, Ronald A., 4,701,637, Cl. 307-297.000.
Pricer, Wilbur D., 4,701,642, Cl. 307-446.000.
Wang, John S., 4,701,752, Cl. 340-723.000.
International Computers Limited: *See*—
Naven, Finbar; and Hale, Stuart G., 4,701,916, Cl. 371-15.000.
International Container Systems, Inc.: *See*—
Hammett, Roy, 4,700,836, Cl. 206-427.000.
Hammett, Roy, 4,700,837, Cl. 206-427.000.
International Cybernetic Corporation: *See*—
McNally, Paul F.; Allen, Spencer W.; and Cimbala, Matthew G., 4,701,839, Cl. 364-167.000.
International Flavors & Fragrances Inc.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Miller, Kevin P.; and Wiener, Charles, 4,701,548, Cl. 560-152.000.
International Paper Company: *See*—
Gibbons, Charles E.; and Whillock, Allan A., 4,701,360, Cl. 428-35.000.
Intevep, S.A.: *See*—
Garcia, Juan J.; Galiasso, Roberto E.; Ramirez de Agudelo, Magdalena M.; Rivas, Luis; and Hurtado, Juan, 4,701,435, Cl. 502-252.000.
IntraTechnology Associates, Inc.: *See*—
Fawzy, Moharram M., 4,701,656, Cl. 310-254.000.
Intravascular Surgical Instruments, Inc.: *See*—
Kensey, Kenneth; and Nash, John, 4,700,705, Cl. 128-341.000.
Inui, Toshiharu: *See*—
Moriguchi, Haruhiko; Inui, Toshiharu; and Ishida, Yoshihiro, 4,701,811, Cl. 358-298.000.
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Schroder, Joris, 4,700,846, Cl. 211-41.000.
Iona Appliances Inc./Appareils Iona Inc.: *See*—
Hetherington, Michael W., 4,700,428, Cl. 15-338.000.
Iowa State University Research Foundation, Inc.: *See*—
Roth, James A.; Canning, Peter C.; and Chiang, Yu-Wei, 4,701,323, Cl. 424-88.000.
Irving, Nicholas M., to Dow Chemical Company, The. Sterospecific catalyst for the preparation of poly (1,2-butylene oxide). 4,701,520, Cl. 528-412.000.
Isherwood, Jonathan M.; and Gibbs, Andrew R., to NCR Corporation. Data input system including a keyboard having no moving parts. 4,701,747, Cl. 340-365.00P.
Ishibashi, Kiyoshi; and Ukai, Yujiro, to Aisin Seiki Kabushiki Kaisha. Refrigerating system. 4,700,545, Cl. 62-6.000.
Ishibashi, Nobuyuki: *See*—
Kiuchi, Masao; Ito, Yoshiaki; Ishibashi, Nobuyuki; and Yamada, Kazuo, 4,701,368, Cl. 428-233.000.

Ishida, Yoshihiro: *See*—
Moriguchi, Haruhiko; Inui, Toshiharu; and Ishida, Yoshihiro, 4,701,811, Cl. 358-298.000.
Ishihara, Hideaki: *See*—
Kurita, Kazuo; and Ishihara, Hideaki, 4,701,377, Cl. 428-364.000.
Ishihara, Kiyoshi: *See*—
Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, 4,701,819, Cl. 360-122.000.
Ishizaka, Shoji: *See*—
Tanimoto, Akikazu; and Ishizaka, Shoji, 4,701,606, Cl. 250-201.000.
Ishizaki, Akira; and Arakawa, Kazuhiko, to Canon Kabushiki Kaisha. Accumulation time adjusting device for photo-electric converter. 4,701,626, Cl. 250-578.000.
Isono, Yasuo: *See*—
Mimura, Yoshiyuki; and Isono, Yasuo, 4,701,042, Cl. 355-3.0DD.
Istituto Guido Donegani S.p.A.: *See*—
Venturello, Carlo; Alneri, Enzo; Coassolo, Alfredo; and D'Aloisio, Rino, 4,701,550, Cl. 560-180.000.
Itagaki, Takushi: *See*—
Sato, Kazuhiko; Nakamura, Genshiro; and Itagaki, Takushi, 4,701,572, Cl. 136-258.000.
Ito, Akio; Mochizuki, Hideaki; Sunohara, Masaaki; and Tamura, Tooru, to Matsushita Electric Industrial Co., Ltd. Substrate for an optical disc. 4,701,770, Cl. 346-135.100.
Ito, Hiromitsu: *See*—
Mitsukuchi, Kunio; Ito, Hiromitsu; Eguchi, Isamu; Hirasato, Bunji; and Furuhata, Takashi, 4,701,583, Cl. 200-148.00B.
Ito, Seigo; and Murakami, Yoshikazu, to Sony Corporation. Magnetic apparatus including thin film YIG resonator. 4,701,729, Cl. 333-219.000.
Ito, Takaaki: *See*—
Uranishi, Koji; Ito, Takaaki; and Tanahashi, Toshio, 4,701,198, Cl. 55-387.000.
Ito, Takayuki: *See*—
Kishi, Hajimu; Sakakibara, Shinsuke; and Ito, Takayuki, 4,701,686, Cl. 318-632.000.
Ito, Takeo: *See*—
Kurachi, Hisao; Minaminaka, Kazuyoshi; Ito, Takeo; and Yamakawa, Kiyoshi, 4,701,579, Cl. 200-5.00A.
Ito, Yoji: *See*—
Hayashi, Yoshimasa; Minezaki, Yutaka; Ito, Yoji; Inoue, Naoyuki; and Hirano, Yoshinori, 4,700,664, Cl. 123-41.270.
Ito, Yoshiaki: *See*—
Kiuchi, Masao; Ito, Yoshiaki; Ishibashi, Nobuyuki; and Yamada, Kazuo, 4,701,368, Cl. 428-233.000.
Itoh, Hiroshi; Nitta, Atsuhiko; and Kamio, Hideo, to Mitsui Toatsu Chemical, Incorporated. Process for preparing amidoalkanesulfonic acids. 4,701,283, Cl. 260-507.00R.
Itoh, Kiyoo: *See*—
Aoki, Masakazu; Horiguchi, Masashi; Nakagome, Yoshinobu; Ikenaga, Shinichi; Shimohigashi, Katsuhiro; Masuhara, Toshiaki; Itoh, Kiyoo; Nakamura, Hideo; and Minato, Osamu, 4,701,884, Cl. 365-189.000.
Itoh, Kunio; Shiobara, Toshio; Futatsumori, Koji; Tomiyoshi, Kazutoshi; and Shimizu, Hisashi, to Shin-Etsu Chemical Co., Ltd. Epoxy resin composition for encapsulation of semiconductor devices. 4,701,482, Cl. 523-435.000.
Itou, Takaaki: *See*—
Uranishi, Kouji; and Itou, Takaaki, 4,700,683, Cl. 123-519.000.
ITT Gallium Arsenide Technology Center: *See*—
Bahl, Inder J.; and Griffin, Edward L., 4,701,573, Cl. 174-52.0FP.
ITT Industries, Inc.: *See*—
Fennel, Helmut, 4,701,855, Cl. 364-426.000.
Iwakura, Ken: *See*—
Satomura, Masato; Iwakura, Ken; and Kawakami, Hiroshi, 4,701,565, Cl. 568-644.000.
Iwamoto, Masayuki; Araki, Setsuo; and Sone, Yasuo, to Shinohara Machinery Co., Ltd. Reversing gripper of one side and perfecting printing press. 4,700,626, Cl. 101-230.000.
Iwano, Tatsuya: *See*—
Nakagawa, Masatsugu; and Iwano, Tatsuya, 4,701,755, Cl. 340-825.020.
Iwasaki, Hirofumi, to Asahi Kasei Kogyo Kabushiki Kaisha. Formable nonwoven sheet. 4,701,365, Cl. 428-171.000.
Iwasaki, Tetsuaki: *See*—
Ushiki, Hiroshi; and Iwasaki, Tetsuaki, 4,701,748, Cl. 340-365.00S.
Iwasaki, Yoshitaka; Mori, Kunio; and Tanabe, Yoshio, to Teraoka Seiko Co., Ltd. Electronic scale printer. 4,700,791, Cl. 177-2.000.
Iwase, Takahiro: *See*—
Tamaki, Shigenori; Machizuki, Hiroyuki; Kobayashi, Nobuo; Iwase, Takahiro; and Masuda, Naofumi, 4,701,346, Cl. 427-46.000.
Iwashita, Yoshihiro: *See*—
Kanda, Mutsumi; Okumura, Takeshi; and Iwashita, Yoshihiro, 4,700,665, Cl. 123-41.82R.
Iwata, Hideyuki: *See*—
Chikamori, Sunao; and Iwata, Hideyuki, 4,700,933, Cl. 267-140.100.
Iwata, Kazuhiro: *See*—
Kobayashi, Waichi; Akegi, Seiji; and Iwata, Kazuhiro, 4,701,222, Cl. 106-288.00B.
Iwata, Takahiro, to Honda Giken Kogyo K.K. Intake air quantity control method for internal combustion engines at deceleration. 4,700,674, Cl. 123-327.000.
Iwata, Yasunari; and Usui, Hirokazu, to Toyota Jidosha Kabushiki Kaisha. Abnormality determination system for revolution speed sensor. 4,700,563, Cl. 73-118.100.
Izumi, Takashi: *See*—
Homma, Shirou; Izumi, Takashi; and Murakami, Sakae, 4,701,508, Cl. 526-249.000.
J. I. Case Company: *See*—
Wiebe, Kenneth J.; Harwood, J. Richard; and Martin, Russell J., 4,700,784, Cl. 172-126.000.
J. M. Voith, GmbH: *See*—
Beisswanger, Rudolf; Wohrle, Albert, deceased; and Plomer, Anton, 4,700,658, Cl. 118-67.000.
Jack, Curtis A.: *See*—
Emkey, William L.; and Jack, Curtis A., 4,701,011, Cl. 350-96.180.
Jack, Kenneth H., to University of Newcastle Upon Tyne, The. Composite materials and products. 4,701,381, Cl. 428-548.000.
Jackson, Joseph F., to Pratt Burnerd International Limited. Chucks. 4,700,955, Cl. 279-4.000.
Jackson, Robert L., to International Business Machines Corporation. Seeding process for electroless metal deposition. 4,701,351, Cl. 427-98.000.
Jacob, Keith D., to C-D Marketing, Ltd. Day/night mirror. 4,701,022, Cl. 350-278.000.
Jaeger, Raymond E.; and Aslami, Mohd, to Spectran Corporation. Fiber optic pressure sensor. 4,701,614, Cl. 250-227.000.
Jakobsen, Kjell M.; and Nilsson, Claes T., to PLM AB. Apparatus for producing a biaxially oriented container of polyethylene terephthalate or similar material. 4,701,121, Cl. 425-526.000.
James, James R., Sr.: *See*—
Schleicher, John K.; and James, James R., Sr., 4,700,870, Cl. 222-63.000.
James, Ronald N.: *See*—
Buck, David A.; and James, Ronald N., 4,700,787, Cl. 173-164.000.
Jamieson Manufacturing Company, Inc.: *See*—
Kesselring, Wolfgang, 4,701,120, Cl. 425-369.000.
Jamiolkowski, Dennis D.; and Shalaby, Shalaby W., to Ethicon, Inc. Surgical articles of copolymers of glycolide and ε-caprolactone and methods of producing the same. 4,700,704, Cl. 128-335.500.
Janiga, Eugene R., to Masonite Corporation. Lignosulfonate-phenol-formaldehyde resin binder in sheet material and method of making said sheet material. 4,701,383, Cl. 428-527.000.
Janka, John C.; Schora, Frank C.; and Knowlton, Ted M., to Hycrude Corporation. Solids dewatering apparatus and process. 4,701,266, Cl. 210-803.000.
Janome Sewing Machine Co. Ltd.: *See*—
Eguchi, Yasukata; Hanyu, Susumu; Hara, Kazumasa; and Koike, Mikio, 4,700,644, Cl. 112-255.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Kuwahara, Hideyuki; Kondo, Bunji; Takada, Jun; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,701,301, Cl. 419-21.000.
Japan Tobacco Inc.: *See*—
Mizusaki, Shigenobu; Yoshida, Daisuke; and Saito, Yutaka, 4,701,570, Cl. 568-821.000.
Susumu, Kubo; Tsutomu, Ikeda; Yoichi, Takanami; and Yoichi, Mikami, 4,701,522, Cl. 530-370.000.
Jasper, Steven C., to Motorola, Inc. Method of doppler searching in a digital GPS receiver. 4,701,934, Cl. 375-1.000.
Jautakis, Karl: *See*—
Drews, Reinhold A.; Jautakis, Karl; and Kuyper, Mark E., 4,700,495, Cl. 34-133.000.
Jaycox, Donald F.: *See*—
Kupferschmidt, Albert; Greene, Tracy D.; and Jaycox, Donald F., 4,700,995, Cl. 439-276.000.
Volk, Thomas G.; and Jaycox, Donald F., 4,701,135, Cl. 439-54.000.
Jednacz, Scott T.: *See*—
Lohrenz, Marold H.; Thies, Joel O.; and Jednacz, Scott T., 4,700,909, Cl. 242-182.000.
Jellinek, Karl; Meier, Bert; and Grundke, Ulrich, to Rutgerswerke Aktiengesellschaft. Radiation cross-linkable binding agents. 4,701,478, Cl. 522-97.000.
Jelling, Murray. Method of pothole repair. 4,701,070, Cl. 404-75.000.
Jenkins, Jack E. Captivated, pre-loaded spring means for vacuum displaced circuit board testing. 4,701,700, Cl. 324-158.00F.
Jergl, Joseph J.: *See*—
Kump, William H.; and Jergl, Joseph J., 4,701,386, Cl. 429-179.000.
Jerone Technologies, Inc.: *See*—
Smith, Edgar D., 4,701,090, Cl. 413-13.000.
Jeumont-Schneider Corporation: *See*—
Guillaumin, Jacquest, 4,701,632, Cl. 307-261.000.
Jewell, Jack L., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Thermal stable optical logic element. 4,701,030, Cl. 350-354.000.
Jidosha Kiki Co., Ltd.: *See*—
Uchino, Kazuyoshi; and Nikaido, Masaya, 4,700,733, Cl. 137-117.000.
Johannes Heidenhain GmbH: *See*—
Schmitt, Walter, 4,701,615, Cl. 250-237.00G.
Johansson, Alf I.; and Rosendahl, Bengt R. Driver training apparatus for simulating skid conditions of an automobile. 4,700,798, Cl. 180-209.000.
Johansson, Bjorn-Olow: *See*—
Bolmstedt, Ulf; and Johansson, Bjorn-Olow, 4,700,770, Cl. 165-1.000.
Johansson, Paul J. Patient transfer mat. 4,700,416, Cl. 5-81.00R.

John Wyeth and Brother Limited: *See—*
Wyllie, Michael G., 4,701,462, Cl. 514-323.000.
Johns, Reginald B.: *See—*
Harvey, Kaye F.; Johns, Reginald B.; Buchanan, Alan S.; and Cain, David A., 4,701,184, Cl. 44-10.00D.
Johnson, Bruce K., to Polaroid Corporation. Copy accessory for instant camera. 4,701,039, Cl. 354-80.000.
Johnson & Johnson Products, Inc.: *See—*
Sun, Robert L.; and Kenney, James F., 4,701,509, Cl. 526-264.000.
Johnson, Lynn A., to Kimberly-Clark Corporation. Form-fitting self-adjusting disposable garment with angled direction stretchable outer cover. 4,701,174, Cl. 604-385.00A.
Johnson Matthey Public Limited Company: *See—*
Barker, Martyn C.; and Rowlands, Edward G., 4,701,218, Cl. 106-114.000.
Jonca, Henri V. J., to Societe Nationale Industrielle Aerospatiale. System for the production of electrical wiring parts. 4,701,007, Cl. 350-96.100.
Jones, Graeme P., to Polyhitech. Electrical connector providing switchable connections between elements. 4,701,134, Cl. 439-43.000.
Jones, Thomas M.; and Chastain, David M. Diagnostic circuit. 4,701,917, Cl. 371-16.000.
Jonsson, Ingvar: *See—*
Karlsson, Bjorn; G.; and Jonsson, Ingvar, 4,701,698, Cl. 324-116.000.
Joppien, Hartmut: *See—*
Franke, Heinrich; Joppien, Hartmut; and Franke, Helga, 4,701,563, Cl. 568-639.000.
Joseph, Philippe, to S.A.M.M - Societe d'Applications des Machines Motrices. Ground clearance corrector for a suspension element of a heavy vehicle. 4,700,969, Cl. 280-705.000.
Joseph, Philippe, to S.A.M.M. - Societe d'Applications de Machines Motrices. Suspension element for a heavy vehicle. 4,700,970, Cl. 280-705.000.
Jost, Ernest M.; and Santala, Timo J., to Chemet Corporation. Method of making electrical contacts. 4,700,475, Cl. 29-874.000.
Jozefczak, Thadius F., to General Motors Corporation. Wind deflector for vehicle side window. 4,700,980, Cl. 296-1.00S.
Jse, Lin J. Pile construction method for improving bearing power. 4,701,078, Cl. 405-238.000.
Judkins, Kenneth R.; and Osmundson, Michael D. Reduction of iron ore concentrates with magnesium or aluminum. 4,701,213, Cl. 75-27.000.
Julius Blum Gesellschaft m.b.H.: *See—*
Rock, Erich; and Hollenstein, Helmut, 4,700,994, Cl. 312-330.00R.
Jung, Il N.; Cho, Ko D.; Lim, John C.; and Yoo, Bok-Ryul, to Korea Advance Institute of Science & Technology. Hydrogenation catalyst and methods for its preparation and use to convert silicon tetrachloride to chlorosilane and silane. 4,701,430, Cl. 502-62.000.
Junkosha Co., Ltd.: *See—*
Suzuki, Hirosuke; and Imaizumi, Haruo, 4,701,362, Cl. 428-131.000.
Wada, Toshio; and Hirano, Tatsuo, 4,701,576, Cl. 174-117.00F.
Juranek, Hans-Joachim: *See—*
Hager, Karl-Heinz; Henneberg, Peter; and Juranek, Hans-Joachim, 4,701,023, Cl. 350-321.000.
Jurczyszyn, Michel; and Marchand, Michel, to Compagnie Industrielle des Telecommunications. Optical source with optical fiber carrier. 4,701,013, Cl. 350-96.200.
Jurinak, Edward L., to Apollo Labeling Systems. Ink fountain and ink fountain support for printing press. 4,700,631, Cl. 101-350.000.
Kabe, Toshiaki; and Kameyama, Hideo. Chemical heat pump system. 4,701,199, Cl. 62-4.000.
Kabushiki Kaisha Aideie: *See—*
Ide, Manabu, 4,701,084, Cl. 409-131.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See—*
Takauji, Kiyomi; and Kondo, Tatsunori, 4,700,603, Cl. 84-1.190.
Kabushiki Kaisha Toshiba: *See—*
Ando, Hideo, 4,701,604, Cl. 250-201.000.
Fujita, Reiko; and Enda, Masami, 4,701,246, Cl. 204-130.000.
Ichihara, Katsutarou, 4,701,880, Cl. 365-106.000.
Imai, Motomasa; Harata, Mitsuo; Takahashi, Takashi; and Nishijima, Kazuo, 4,701,767, Cl. 346-74.200.
Kawakatsu, Akira; Yuge, Yooji; Hayama, Noriyuki; Saito, Tokuyoshi; and Maeda, Umio, 4,701,663, Cl. 313-112.000.
Konishi, Kazuo; and Nishikawa, Meisei, 4,701,875, Cl. 364-728.000.
Matsushita, Akira, 4,701,914, Cl. 371-13.000.
McIlroy, Paul W. A.; Kurobe, Atsushi; and Furuyama, Hideto, 4,701,774, Cl. 357-17.000.
Nagata, Minoru, 4,701,719, Cl. 330-258.000.
Nakagawa, Akio; Ohashi, Hiromichi; Ogura, Tsuneo; and Shimbo, Masaru, 4,700,466, Cl. 437-247.000.
Nakagawa, Akira, 4,701,897, Cl. 369-32.000.
Okazaki, Kiyoshi, 4,700,571, Cl. 73-597.000.
Sagoi, Masayuki; Tanaka, Yoichiro; and Nakamura, Hiroki, 4,701,374, Cl. 428-336.000.
Sahoda, Masayuki; Tanaka, Fuminari; and Iida, Tetsuya, 4,701,877, Cl. 364-784.000.
Shimada, Kizashi; Akiyama, Tatsuo; and Koshino, Yutaka, 4,700,455, Cl. 437-39.000.
Takashima, Shigekazu; and Sakamoto, Tsutomu, 4,701,864, Cl. 364-521.000.
Ushiki, Hiroshi; and Iwasaki, Tetsuaki, 4,701,748, Cl. 340-365.00S.
Yamanaka, Junichi, 4,701,786, Cl. 358-32.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Kudo, Takumi, 4,700,757, Cl. 141-311.00R.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Doi, Shunichi; Sugiura, Noboru; Hayashi, Yasutaka; and Yamamoto, Yuzo, 4,700,971, Cl. 280-707.000.
Miki, Kazuo; Hayashi, Yasutaka; Fukui, Katsuhiko; and Sumi, Kazumasa, 4,700,960, Cl. 280-91.000.
Kabushiki Kaisha Universal: *See—*
Okada, Kazuo, 4,700,948, Cl. 273-143.00R.
Kagitani, Yoshio: *See—*
Ueda, Yasuo; Kagitani, Yoshio; Komeda, Shirou; and Funakoshi, Satoshi, 4,701,325, Cl. 424-164.000.
Kaim, John W.: *See—*
Altherr, Russell G.; and Kaim, John W., 4,700,853, Cl. 213-50.000.
Kain, Richard Y.: *See—*
Boebert, William E.; and Kain, Richard Y., 4,701,840, Cl. 364-200.000.
Kaiser Aluminum & Chemical Corporation: *See—*
Taylor, Dennis R.; and Gallavan, Kevin P., 4,701,438, Cl. 502-405.000.
Kaiser, Bruce J.; Walker, Edward S.; Tunnell, George W.; and Masaitis, William, to General Electric Company. Monitor for airborne radioactive particles. 4,701,621, Cl. 250-435.000.
Kaiser, Frederick A.: *See—*
Andrews, Rodney R.; Ferguson, John H.; Kaiser, Frederick A.; and Coman, William E., 4,701,068, Cl. 403-359.000.
Kaiser, Manfred, to Standard Elektrik Lorenz. Optical multiplexer/demultiplexer. 4,701,012, Cl. 350-96.190.
Kaji, Isao: *See—*
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Kaji, Isao; Hasegawa, Masakazu; Tan, Masayuki; and Kurata, Masaru, 4,701,117, Cl. 425-116.000.
Kajima Kensetsu Kabushiki Kaisha: *See—*
Akihama, Shigeyuki; Saito, Makoto; Kawamoto, Akio; Banno, Tadashi; Umeki, Yoshihiko; and Nakamura, Takumi, 4,700,518, Cl. 52-309.160.
Kakuta, Yonehiro: *See—*
Saito, Kaoru; Noji, Akio; Kakuta, Yonehiro; and Takigawa, Koichi, 4,700,479, Cl. 33-366.000.
Kalnins, John M.; McIntyre, James A.; Moyer, John R.; Phillips, Robert F.; and Snoble, Karel A. J., to Dow Chemical Company, The. Electrochemical methods for breaking high viscosity fluids. 4,701,247, Cl. 204-131.000.
Kalra, Satya P., to University of Florida. Methods and compositions for stimulation of appetite. 4,701,441, Cl. 514-12.000.
Kameda, Yukihiko: *See—*
Horii, Satoshi; Kameda, Yukihiko; and Fukase, Hiroshi, 4,701,559, Cl. 564-363.000.
Kameya, Kazuo, to Elmec Corporation. Connection construction for electronic component. 4,701,723, Cl. 333-33.000.
Kameyama, Hideo: *See—*
Kabe, Toshiaki; and Kameyama, Hideo, 4,701,199, Cl. 62-4.000.
Kamiji, Koichi: *See—*
Kumasaka, Toru; Ohya, Toshikazu; and Kamiji, Koichi, 4,701,628, Cl. 307-9.000.
Kamijyukkoku, Nario: *See—*
Koebisu, Mamoru; Nishioka, Takeshi; Kamijyukkoku, Nario; and Kawano, Hirosi, 4,701,472, Cl. 521-50.500.
Kamin, Paul N. Aviation fuel tester. 4,700,580, Cl. 73-864.510.
Kaminski, Daniel S.: *See—*
Bratton, Ronald E.; Gigandet, Richard W.; Henke, Mitchell C.; Kaminski, Daniel S.; and Wibel, Michelle A., 4,701,340, Cl. 426-511.000.
Kamio, Hideo: *See—*
Itoh, Hiroshi; Nitta, Atsuhiko; and Kamio, Hideo, 4,701,283, Cl. 260-507.00R.
Kamio, Takashi: *See—*
Iijima, Toshifumi; Yamada, Yoshitaka; Kumashiro, Kenji; Kamio, Takashi; and Shimura, Shinya, 4,701,404, Cl. 430-559.000.
Kamiya, Kiyoshi, to Citizen Watch Co., Ltd. Synchronization signal generating circuit. 4,701,796, Cl. 358-154.000.
Kamiya, Osamu, to Brother Kogyo Kabushiki Kaisha. Sewing machine with retractable handwheel. 4,700,646, Cl. 112-279.000.
Kanai, Masahiro: *See—*
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,701,392, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,701,393, Cl. 430-57.000.
Kanaiwa, Kiyoshi: *See—*
Ueda, Sigel; Matsumoto, Kozo; Kanaiwa, Kiyoshi; and Adachi, Muneo, 4,701,746, Cl. 340-347.0DD.
Kanda, Mutsumi; Okumura, Takeshi; and Iwashita, Yoshihiro, to Toyota Jidosha Kabushiki Kaisha. Cylinder head with coolant passage passing around outside of cylinder head fixing bolt boss and directing coolant flow toward squish area cooling passage portion. 4,700,665, Cl. 123-41.82R.
Kaneda, Takao; and Nakajima, Kazuo, to Fujitsu Limited. Semiconductor device for receiving light. 4,701,773, Cl. 357-13.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Tawada, Yoshihisa; and Tsuge, Kazunori, 4,701,344, Cl. 427-39.000.
Kaneko, Dentaro; and Meissner, David C., to Midrex International B.V. Rotterdam. Method of producing iron using rotary hearth and apparatus. 4,701,214, Cl. 75-38.000.
Kaneko, Hiroko: *See—*
Koyanagi, Mitsumasa; and Kaneko, Hiroko, 4,701,349, Cl. 427-93.000.

Kaneko, Junya, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Pneumatic cylinder motor with end-of-travel cushioning mechanism. 4,700,611, Cl. 91-405.000.
Kaneko, Kiyotaka: *See*—
Miyake, Izumi; Kaneko, Kiyotaka; and Oda, Kazuya, 4,701,813, Cl. 360-71.000.
Kaneko, Takashi: *See*—
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, 4,701,496, Cl. 525-240.000.
Kaplan, Robert A.: *See*—
Tallman, William R.; and Kaplan, Robert A., 4,701,123, Cl. 431-171.000.
Karkar, Maurice N.: *See*—
Hoffa, Jack L.; and Karkar, Maurice N., 4,700,560, Cl. 73-1.00G.
Karlsson, Bjorn; G.; and Jonsson, Ingvar. Microprocessor based energy consumption meter. 4,701,698, Cl. 324-116.000.
Kasahara, Seitaro: *See*—
Horiuchi, Tatsumi; Kasahara, Seitaro; and Sawaki, Akira, 4,701,044, Cl. 355-7.000.
Kasai, Syozi: *See*—
Hirotsu, Tetsuji; Kiwaki, Hisakatsu; Nakamura, Kiyoshi; Narita, Hiroshi; Kasai, Syozi; Kimura, Akira; and Tsutsui, Yoshio, 4,701,682, Cl. 318-52.000.
Kasevich Associates, Inc.: *See*—
Kasevich, Raymond S.; McQueeney, James F.; and Crooker, Ronald H., 4,700,716, Cl. 128-804.000.
Kasevich, Raymond S.; McQueeney, James F.; and Crooker, Ronald H., to Kasevich Associates, Inc. Collinear antenna array applicator. 4,700,716, Cl. 128-804.000.
Kash, Albert. Acoustic imager. 4,701,951, Cl. 381-24.000.
Kashiwabara, Yoshihiro, to Nippon Thompson Co., Ltd. Linear motion rolling contact bearing assembly. 4,701,057, Cl. 384-45.000.
Kashiwagi, Hiroshi: *See*—
Takiguchi, Hideki; Yamada, Yoshitaka; Ohtani, Hirofumi; and Kashiwagi, Hiroshi, 4,701,405, Cl. 430-567.000.
Kaspers, Helmut; Duben, Jiri; and Gisi, Ulrich, to Sandoz Ltd. Fungicidal compositions of oxadixyl and anilazine and their use. 4,701,454, Cl. 514-245.000.
Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Compartmented packaging box for commodity and accessory. 4,700,831, Cl. 206-232.000.
Kassing, Lothar: *See*—
Groesch, Lothar; Netzer, Gabriel; and Kassing, Lothar, 4,701,132, Cl. 434-274.000.
Kasuga, Akira: *See*—
Miyoshi, Takahito; Kasuga, Akira; and Fujiyama, Masaaki, 4,701,364, Cl. 428-141.000.
Kataoka, Fukuhiko: *See*—
Kondo, Kiyoshi; Kataoka, Fukuhiko; and Uno, Kiyotaka, 4,700,817, Cl. 188-380.000.
Kataoka, Jiro: *See*—
Ikemoto, Yoshihiro; Kataoka, Jiro; Otsuki, Toshinori; and Nakamura, Takuji, 4,701,810, Cl. 358-296.000.
Kato, Akira: *See*—
Otobe, Yutaka; Kato, Akira; and Chikamatsu, Masataka, 4,700,675, Cl. 123-339.000.
Otobe, Yutaka; Kato, Akira; Hosoda, Fumio; and Takagi, Akinobu, 4,700,679, Cl. 123-327.000.
Kato, Kenshiro: *See*—
Endo, Kazuyuki; Taniguchi, Motoaki; Takahashi, Masanobu; Yamada, Shigeki; and Kato, Kenshiro, 4,700,764, Cl. 152-526.000.
Kato, Noboru; Matsuura, Hideji; and Umemura, Shinichiro, to Fuji Electrochemical Co., Ltd. Electronic circuit module. 4,701,830, Cl. 361-395.000.
Kato, Nobuyuki; and Kobayashi, Akira, to Toyo Seikan Kaisha, Ltd. Method of forming bottomed cylindrical bodies from a cylindrical body of thermoplastic resin. 4,701,295, Cl. 264-519.000.
Katoh, Kazunobu, to Fuji Photo Film Co., Ltd. Silver salt diffusion transfer photographic element with cationic polymer. 4,701,400, Cl. 430-233.000.
Katoh, Mitsumi, to Nippon Gakki Seizo Kabushiki Kaisha. Tone signal processing device. 4,701,956, Cl. 381-61.000.
Katopodis, Nonda, to Dianon Systems, Inc. Method for determining lipid bound sialic acid in whole blood. 4,701,418, Cl. 436-64.000.
Katsuno, Hiroshi, to Tokai Sogo Sekkei Kabushiki Kaisha. Anti-impact safety apparatus for robot. 4,700,932, Cl. 267-136.000.
Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, to Kureha Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin composition. 4,701,495, Cl. 525-75.000.
Kauke, Heinz, to Pall Corporation. Filter test device. 4,701,861, Cl. 364-502.000.
Kauth, Hermann; Schmidt, Manfred; Freitag, Dieter; Rudolph, Udo; and Kleiner, Frank, to Bayer Aktiengesellschaft. Process for the preparation of polyphosphonic acid amides. 4,701,554, Cl. 564-14.000.
Kavehrad, Mohsen; and Sundberg, Carl-Erik, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Collision detection technique for an optical passive star local area network using CSMA/CD. 4,701,909, Cl. 370-85.000.
Kawabe, Manabu: *See*—
Fukasawa, Atsushi; Sato, Takuro; Akiyama, Haruhiko; and Kawabe, Manabu, 4,701,923, Cl. 371-41.000.
Kawaguchi, Toshiyuki; Suzuki, Hideki; and Usuda, Tsuneo, to Shin-Etsu Polymer Co., Ltd. Anisotropically electroconductive adhesives. 4,701,279, Cl. 252-511.000.
Kawajiri, Kazuhiro: *See*—
Tabei, Masatoshi; and Kawajiri, Kazuhiro, 4,701,798, Cl. 358-213.260.
Kawakami, Hiroshi: *See*—
Satomura, Masato; Iwakura, Ken; and Kawakami, Hiroshi, 4,701,565, Cl. 568-644.000.
Kawakatsu, Akira; Yuge, Yooji; Hayama, Noriyuki; Saito, Tokuyoshi; and Maeda, Umio, to Kabushiki Kaisha Toshiba. Lamp having interference film. 4,701,663, Cl. 313-112.000.
Kawaminami, Syuichi: *See*—
Fujikawa, Nobuyoshi; Kawaminami, Syuichi; and Yokoe, Nobuo, 4,701,827, Cl. 361-309.000.
Kawamoto, Akio: *See*—
Akihama, Shigeyuki; Saito, Makoto; Kawamoto, Akio; Banno, Tadashi; Umeki, Yoshihiko; and Nakamura, Takumi, 4,700,518, Cl. 52-309.160.
Kawamura, Makoto: *See*—
Ikeda, Kazuhiko; and Kawamura, Makoto, 4,701,846, Cl. 364-200.000.
Kawano, Akio, to Honda Giken Kogyo Kabushiki Kaisha. Frameless motorcycle. 4,700,799, Cl. 180-219.000.
Kawano, Hirosi: *See*—
Koebisu, Mamoru; Nishioka, Takeshi; Kamijyukkoku, Nario; and Kawano, Hirosi, 4,701,472, Cl. 521-50.500.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nishida, Hiroshi, 4,700,650, Cl. 114-125.000.
Kawasaki, Kazuhiro; and Muranaka, Akio, to Honda Giken Kogyo Kabushiki Kaisha. Helmet. 4,700,411, Cl. 2-425.000.
Kawata, Koichi: *See*—
Masaki, Takeshi; Kawata, Koichi; Sakagaito, Yukuo; Yamaguchi, Katsumasa; Kinoshiro, Hiromichi; and Toba, Hiroto, 4,701,591, Cl. 219-121.0LT.
Kawazoe, Akio; and Inoue, Satoru, to Oki Electric Industry Co., Ltd. Current driving circuit with CMOS inverter. 4,701,635, Cl. 307-270.000.
Kayane, Yutaka; Sawamoto, Hirokazu; Omura, Takashi; Harada, Naoki; and Takeshita, Akira, to Sumitomo Chemical Company, Limited. Pyridone monoazo compound having vinylsulfone type fiber-reactive group. 4,701,524, Cl. 534-642.000.
Kazlaukas, Romas J.: *See*—
Whitesides, George M.; Crans, Debbie C.; and Kazlaukas, Romas J., 4,701,285, Cl. 260-545.00P.
Kazusaka, Shoji: *See*—
Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; Bingo, Hideyuki; Kazusaka, Shoji; and Konishi, Keisuke, 4,701,582, Cl. 200-61.420.
Kefer, Joseph; and Ruf, Gerhard, to Dorina Nahmaschinen GmbH. Sewing machine housing construction. 4,700,645, Cl. 112-259.000.
Kehrer, Wolfgang, to Borsig GmbH. Nested-tube heat exchanger. 4,700,773, Cl. 165-134.100.
Keirstead, Mark S.: *See*—
Baer, Thomas M.; and Keirstead, Mark S., 4,701,929, Cl. 372-71.000.
Keith and Grossman Leasing Company: *See*—
Grossman, Stanley J., 4,700,516, Cl. 52-223.00R.
Kelder, Jan; and Verheul, Hermanus A. M., to Akzo N.V. Steroids for use as immunomodulators. 4,701,450, Cl. 514-177.000.
Kellenberger, Stanley R.; Rajala, Gregory J.; and Stevens, Robert A., to Kimberly-Clark Corporation. Fixed position fasteners for disposable absorbent garments. 4,701,179, Cl. 604-394.000.
Kellenberger, Stanley R.: *See*—
Wilson, John C.; Stevens, Robert A.; Boland, Leona G.; Rajala, Gregory J.; and Kellenberger, Stanley R., 4,701,170, Cl. 604-385.00A.
Wilson, John C.; Stevens, Robert A.; and Kellenberger, Stanley R., 4,701,176, Cl. 604-385.00A.
Kelly, L. Thomas; Hamel, Esther V. M.; and Bielka, Robert P. Implanted anchor and insert with analog display. 4,701,180, Cl. 604-891.000.
Kelly, Philip L.: *See*—
Szirmai, Stephen G.; Newman, Gerard R.; and Kelly, Philip L., 4,701,941, Cl. 378-122.000.
Kempken, Rainer; and Stolzenberg, Hans, to Paul Forkardt GmbH & Co. Power-operated chuck. 4,700,957, Cl. 279-117.000.
Ken Hayashibara: *See*—
Masaki, Kazumi, 4,701,675, Cl. 315-310.000.
Kendall Company, The: *See*—
Chekan, William J., 4,701,167, Cl. 604-310.000.
Gross, James R., 4,700,922, Cl. 248-558.000.
Rosenberg, Philip, 4,701,162, Cl. 604-103.000.
Kendall, James M., Jr.: *See*—
Wang, Taylor G.; Elleman, Daniel D.; Lee, Mark C.; and Kendall, James M., Jr., 4,701,436, Cl. 502-339.000.
Kenney, James F.: *See*—
Sun, Robert L.; and Kenney, James F., 4,701,509, Cl. 526-264.000.
Kensey, Kenneth; and Nash, John, to Intravascular Surgical Instruments, Inc. Catheter based surgical methods and apparatus therefor. 4,700,705, Cl. 128-341.000.
Kent, David E.: *See*—
Barrett, John P.; Schulz, Daniel R.; Kent, David E.; deFasselle, Robert J.; and Zega, Henry E., 4,700,884, Cl. 236-12.120.
Keptel, Inc.: *See*—
Lynch, Daniel; and Perry, Steven B., 4,701,949, Cl. 379-179.000.
Keranen, John J.; Peret, Scot F.; and Stewart, David R., to Eaton Corporation. Multi-position selector switch assemby means. 4,701,578, Cl. 200-5.00B.

Kern, Mark T.; Hodges, Steven E.; Snider, Danny G.; and Shamordola, Kenneth A., to Santa Barbara Research Center. Fire sensor system utilizing optical fibers for remote sensing. 4,701,624, Cl. 250-554.000.

Kerr-McGee Corporation: *See—*
Sleffel, William M., 4,700,568, Cl. 73-195.000.

Kess, Helmut: *See—*
Freisen, Ludger; Kess, Helmut; Krause, Norbert; and Meissner, Ralph, 4,701,710, Cl. 324-318.000.

Kesselring, Wolfgang, to Jamieson Manufacturing Company, Inc. Apparatus for forming accordion pleats in a thin-walled plastic container. 4,701,120, Cl. 425-369.000.

Key, Edward H., to Phoenix Terminal Blocks Inc. Solderless electrical connector. 4,701,138, Cl. 439-417.000.

Key, Joe W.; and Shumaker, Fred E., to Key Ocean Services, Inc. Vessel mooring system and method for its installation. 4,701,143, Cl. 441-5.000.

Key Ocean Services, Inc.: *See—*
Key, Joe W.; and Shumaker, Fred E., 4,701,143, Cl. 441-5.000.

Keyes, Paul H.; and Taves, Marvin J. Dispensing pump for syringe. 4,700,872, Cl. 222-162.000.

Keystone International, Inc.: *See—*
Bell, Clifford, 4,701,938, Cl. 375-36.000.

Kice, Warren B. Fluidized bed catalytic converter. 4,701,312, Cl. 423-213.700.

Kidde Consumer Durables Corp.: *See—*
Stewart, James B., 4,701,585, Cl. 219-10.55E.

Kiefer, Hans: *See—*
Bewert, Wolfgang; and Kiefer, Hans, 4,701,546, Cl. 558-445.000.

Kievsky Politekhnichesky Institut: *See—*
Levchenko, Georgy T.; and Radzikovsky, Alexandr N., 4,700,660, Cl. 118-726.000.

Kikkawa, Yoshiro, to Sanyo Electric Co., Ltd. Inverter circuit for converting DC power to pulse wave power. 4,701,683, Cl. 318-254.000.

Kikuchi, Tsutomu: *See—*
Ura, Syouzabu; Kikuchi, Tsutomu; and Yasuda, Makoto, 4,700,666, Cl. 123-52.0MB.

Killian, Edmund, to Finkel Outdoor Products, Inc. Table leg assembly and method of assembling same. 4,700,915, Cl. 248-188.100.

Kimberly-Clark Corporation: *See—*
Boland, Leona G.; Zehner, Georgia L.; and Stevens, Robert A., 4,701,171, Cl. 604-385.00A.
Boland, Leona G.; and Stevens, Robert A., 4,701,175, Cl. 604-385.00A.
Ellis, Louise C.; Fahrenkrug, Anne M.; Basten, Julie T.; and Milner, James D., 4,701,177, Cl. 604-385.00A.
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Kimura, Mituo: *See—*
Kuwahara, Hideyuki; Kondo, Bunji; Takada, Jun; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,701,301, Cl. 419-21.000.

Kimura, Takeshi: *See—*
Soda, Yasunari; Mochiji, Kozo; Kimura, Takeshi; and Obayashyi, Hidehito, 4,701,940, Cl. 378-34.000.

Kimura, Tetsuo, to Nittan Company, Limited. Separation type detector with addressed selection. 4,701,625, Cl. 250-573.000.

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Hanafusa, Tooru; Kinugasa, Yukio; and Yaegashi, Takehisa, 4,700,681, Cl. 123-478.000.

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Endo, Shyusuke; Aoyama, Naofumi; Yabuuchi, Toshihiko; Sakuma, Toshiyuki; and Kinugawa, Kiyoshige, 4,701,025, Cl. 350-333.000.

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Tatukawa, Juniti; and Kirihara, Shozo, 4,701,654, Cl. 310-153.000.

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Komiyama, Kanki; Funayama, Shinji; and Umezawa, Iwao, 4,701,324, Cl. 424-118.000.

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Boxhoorn, Gosse; Klazinga, Aan H.; and Velthuis, Otto M., 4,701,437, Cl. 502-348.000.

Klein, Michel: *See—*
Weyers, Charles; Klein, Michel; and Goossens, Walter, 4,701,194, Cl. 55-228.000.

Kleiner, Frank: *See—*
Kauth, Hermann; Schmidt, Manfred; Freitag, Dieter; Rudolph, Udo; and Kleiner, Frank, 4,701,554, Cl. 564-14.000.

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Fassbinder, Hans-Georg, 4,700,578, Cl. 73-861.370.

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Wessel, Ulrich, 4,700,535, Cl. 56-13.600.

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Andres, Rudolf; Knoll, Heinz; Petri, Volker; and Pfistner, Harald, 4,700,974, Cl. 280-806.000.

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Janka, John C.; Schora, Frank C.; and Knowlton, Ted M., 4,701,266, Cl. 210-803.000.

Knuhtsen, John: *See*—
Buchhave, Preben; Knuhtsen, John; and Olldag, Peder E. S., 4,701,051, Cl. 356-336.000.
Kobayashi, Akira: *See*—
Kato, Nobuyuki; and Kobayashi, Akira, 4,701,295, Cl. 264-519.000.
Kobayashi, Isamu: *See*—
Sakakibara, Yasuhiro; Kobayashi, Isamu; and Suzuki, Yoshinori, 4,701,886, Cl. 365-189.000.
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Nakajima, Takayuki; Aoki, Tetsuo; Kobayashi, Katsumi; and Akiyama, Noboru, 4,701,918, Cl. 371-20.000.
Kobayashi, Kenichi: *See*—
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Kobayashi, Shuji: *See*—
Naka, Hiroshi; Seko, Ichiro; Kobayashi, Shuji; and Haneda, Makoto, 4,701,927, Cl. 372-46.000.
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Kobayashi, Waichi; Akegi, Seiji; and Iwata, Kazuhiro, to Ube Industries, Ltd. Process for producing an artificial light-weight aggregate. 4,701,222, Cl. 106-288.00B.
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Kobe, Takashi: *See*—
Tokuda, Ryuji; Haruhari, Yoshihiro; and Kobe, Takashi, 4,701,048, Cl. 356-1.000.
Koching, Horst; and Stude, Rolf-Rudiger, to Kreyenborg Verwaltungen und Beteiligungen KG. Apparatus for filtering plasticized materials in extruders. 4,701,118, Cl. 425-185.000.
Kodaira, Toshimasa: *See*—
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Koebisu, Mamoru; Nishioka, Takeshi; Kamijyukkoku, Nario; and Kawano, Hirosi, to Toray Industries, Inc. Expandable polyvinyl chloride resin composition and foamed sheet prepared from the same. 4,701,472, Cl. 521-50.500.
Koehly, Gerard; and Madic, Charles, to Commissariat a l'Energie Atomique. Process for the recovery of molybdenum-99 from an irradiated uranium alloy target. 4,701,308, Cl. 423-2.000.
Koermer, Gerald S.; Gutierrez, Eddie N.; and Prorok, Maryfrances, to Lever Brothers Company. Synthesis of salicylamides with improved reaction kinetics and improved effective yields. 4,701,527, Cl. 544-277.000.
Koestler, Thomas P., to SmithKline Beckman Corporation. Monoclonal antibody to activated macrophages. 4,701,408, Cl. 435-7.000.
Kohara, Soichiro, to Fujikigyo Co., Ltd. Reinforcing frame work for constructing reinforced concrete structure. 4,700,523, Cl. 52-565.000.
Kohno, Hideki: *See*—
Yamamoto, Etsuji; Kohno, Hideki; and Takeda, Ryuzaburo, 4,701,709, Cl. 324-312.000.
Koike, Eishi, to Ozen Corporation. Starting device for a toy motor using an ultrasonic wave signal. 4,701,681, Cl. 318-16.000.
Koike, Mikio: *See*—
Eguchi, Yasukata; Hanyu, Susumu; Hara, Kazumasa; and Koike, Mikio, 4,700,644, Cl. 112-255.000.
Koishi, Kenji; and Matsuo, Tamotsu, to Matsushita Electric Industrial Co. Ltd. Semiconductor laser drive circuit with peak detection and control. 4,701,609, Cl. 250-205.000.
Koito Seisakusho Co., Ltd.: *See*—
Fuke, Akira; Tokita, Yasuhiro; and Masuda, Katsuhiko, 4,701,925, Cl. 372-38.000.
Koizumi, Yuichiro; Nojima, Masaki; and Shimiya, Keiji, to Canon Kabushiki-Kaisha. Fluorescent screen having a variation in sensitivity and method of manufacturing the same. 4,701,622, Cl. 250-486.100.
Kojima, Tetsuhiko: *See*—
Sugimori, Shigeru; and Kojima, Tetsuhiko, 4,701,547, Cl. 560-102.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Akiba, Shigeyuki; Utaka, Katsuyuki; Sakai, Kazuo; and Matsushima, Yuichi, 4,701,930, Cl. 372-96.000.
Tanaka, Fujio; and Imamura, Nobutake, 4,701,881, Cl. 365-122.000.
Kolek, Robert L.: *See*—
Peters, Stanley T.; Kolek, Robert L.; Guenther, Rolf A.; Anderson, Jeffrey J.; and Marshall, Clarence F., 4,701,231, Cl. 156-172.000.
Koll, Johan, to Berol Kemi AB. Promoted nickel and/or cobalt catalyst, its use, and process performed in its presence. 4,701,434, Cl. 502-230.000.
Kollmorgen Corporation: *See*—
DeLuca, Michael A.; and McCormack, John F., 4,701,352, Cl. 427-98.000.
Kollner, Harald; and Uhlig, Georg, to Rockwell Golde GmbH. Pane guide for an automobile sliding window. 4,700,508, Cl. 49-352.000.
Komatsu, Toshiyuki: *See*—
Inoue, Eiichi; Shimizu, Isamu; and Komatsu, Toshiyuki, 4,701,394, Cl. 430-97.000.
Komatsu, Yasumasa: *See*—
Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, 4,701,495, Cl. 525-75.000.
Komeda, Shirou: *See*—
Ueda, Yasuo; Kagitani, Yoshio; Komeda, Shirou; and Funakoshi, Satoshi, 4,701,325, Cl. 424-164.000.
Komiya, Ryohei; and Terazawa, Masaaki, to Brother Kogyo Kabushiki Kaisha. Thermo-magnetic recording device. 4,701,768, Cl. 346-74.400.
Komiyama, Kanki; Funayama, Shinji; and Umezawa, Iwao, to Kitasato Institute, The. Novel cell-cidal antibiotic 82-85-8A and its production. 4,701,324, Cl. 424-118.000.
Kondo, Bunji: *See*—
Kuwahara, Hideyuki; Kondo, Bunji; Takada, Jun; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,701,301, Cl. 419-21.000.
Kondo, Kiyoshi; Kataoka, Fukuhiko; and Uno, Kiyotaka, to Nippon Kokan Kabushiki Kaisha. Dynamic vibration absorber with spring-supported pendulum. 4,700,817, Cl. 188-380.000.
Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, to FMC Corporation. 3,4-dihydro-4,4-dimethyl-2H-pyran-2-one, an insecticide intermediate. 4,701,539, Cl. 549-294.000.
Kondo, Tatsunori: *See*—
Takauji, Kiyomi; and Kondo, Tatsunori, 4,700,603, Cl. 84-1.190.
Kone Elevator GmbH: *See*—
Otala, Matti, 4,700,810, Cl. 187-101.000.
Konishi, Kazuo; and Nishikawa, Meisei, to Kabushiki Kaisha Toshiba. High speed convolution arithmetic circuit with multiple counters. 4,701,875, Cl. 364-728.000.
Konishi, Keisuke: *See*—
Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; Bingo, Hideyuki; Kazusaka, Shoji; and Konishi, Keisuke, 4,701,582, Cl. 200-61.420.
Konishi, Takeshi: *See*—
Kuraoka, Koji; Umeda, Morio; Konishi, Takeshi; and Tuchiya, Takanori, 4,700,982, Cl. 296-107.000.
Konishiroku Photo Ind. Co., Ltd.: *See*—
Horiuchi, Tatsumi; Kasahara, Seitaro; and Sawaki, Akira, 4,701,044, Cl. 355-7.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Iijima, Toshifumi; Yamada, Yoshitaka; Kumashiro, Kenji; Kamio, Takashi; and Shimura, Shinya, 4,701,404, Cl. 430-559.000.
Takiguchi, Hideki; Yamada, Yoshitaka; Ohtani, Hirofumi; and Kashiwagi, Hiroshi, 4,701,405, Cl. 430-567.000.
Kookootsedes, Gust J.; Reese, Herschel H.; Gutek, Beth I.; and Pretzer, Gale H., to Dow Corning Corporation. Touch position sensitive optical waveguides. 4,701,017, Cl. 350-96.340.
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., to Du Pont de Nemours, E. I., and Company. Chip resistant primer compositions VI'. 4,701,501, Cl. 525-449.000.
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., to Du Pont de Nemours, E. I., and Company. Chip resistant primer composition V'. 4,701,502, Cl. 525-449.000.
Korea Advance Institute of Science & Technology: *See*—
Jung, Il N.; Cho, Ko D.; Lim, John C.; and Yoo, Bok-Ryul, 4,701,430, Cl. 502-62.000.
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Un, Chong K.; Ryu, Seung M.; and Lee, Chong R., 4,701,905, Cl. 370-18.000.
Kornreich, Wayne D.; Anderson, Harry A.; Porter, John S.; and Rivier, Jean E. F., to Salk Institute for Biological Studies, The. Synthesis of N-substituted peptide amides. 4,701,499, Cl. 525-333.300.
Korte, Kevin R.; Litzinger, Elmer; and Wu, Dan T., to Brown & Williamson Tobacco Corporation. Process for retaining alkaloids by treating with strong acids before drying. 4,700,722, Cl. 131-309.000.
Koshino, Yutaka: *See*—
Shimada, Kizashi; Akiyama, Tatsuo; and Koshino, Yutaka, 4,700,455, Cl. 437-39.000.
Kotelnikov, Jury S.: *See*—
Martyshenko, Jury P.; Martyshenko, Sergei J.; Kotelnikov, Jury S.; Kutukhtin, Evgeny G.; Ilyasova, Nelli I.; Volkov, Jury S.; Vardanian, Armenak M.; and Petrosian, Misha S., 4,701,075, Cl. 405-217.000.
Koutake, Masayoshi: *See*—
Kobayashi, Shunsuke; Matsuyama, Yoshihiko; and Koutake, Masayoshi, 4,701,024, Cl. 350-331.00R.
Koyanagi, Mitsumasa; and Kaneko, Hiroko, to Hitachi, Ltd. Semiconductor integrated circuit device and method of producing the same. 4,701,349, Cl. 427-93.000.
Kozlowski, Ted A.: *See*—
Howard, Scott P.; Kozlowski, Ted A.; and Retzer, Michael H., 4,701,944, Cl. 379-63.000.
Kraemer, Johannes; Leclere, Klemens; Nuding, Werner; and Schilde, Heinz-Josef, to Saint-Gobain Vitrage. Device for joining by calendering at least one sheet of glass and at least one film of plastic material. 4,701,240, Cl. 156-555.000.
Kraft, Robert E.: *See*—
Dean, Arthur L.; Kraft, Robert E.; and Marshall, Kenneth M., 4,701,647, Cl. 310-29.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Maghon, Helmut; and Becker, Bernard, 4,701,124, Cl. 431-284.000.
Kraig, Richard P., to Cornell Research Foundation, Inc. Apparatus and method for determining ammonium ion concentration and total ammonia concentration in fluids or tissue. 4,700,709, Cl. 128-635.000.
Kramer, Felix, to Elpatronic AG. Tear-open can number. 4,700,865, Cl. 220-274.000.

Kramer, Melvin G.; and Iden, Marlin D., to Brunton Company, The. Compass. 4,700,490, Cl. 33-355.00D.

Kramer, Wolfgang: *See—*
Hans, Waldemar; Kind, Wilhelm; Knapp, Heinrich; Kramer, Wolfgang; and Sauer, Rudolf, 4,700,891, Cl. 239-132.500.

Kraus, Heinz, to Dr. Johannes Heidenhain GmbH. Self-supporting graduation carrier. 4,700,482, Cl. 33-1.0PT.

Krause, Norbert: *See—*
Freisen, Ludger; Kess, Helmut; Krause, Norbert; and Meissner, Ralph, 4,701,710, Cl. 324-318.000.

Kreh, Robert P., to W. R. Grace & Co. Oxidation of organic compounds using a catalyzed cerium (IV) composition. 4,701,245, Cl. 204-78.000.

Kreuter, Peter: *See—*
Pischinger, Franz; and Kreuter, Peter, 4,700,684, Cl. 123-568.000.

Kreuwel, Johannes G.; and Schipper, Lambert A., to Stork Ketels B.V. Spray unit and degassing installation. 4,701,191, Cl. 55-198.000.

Kreyenborg Verwaltungen und Beteiligungen KG: *See—*
Koching, Horst; and Stude, Rolf-Rudiger, 4,701,118, Cl. 425-185.000.

Krieger, Zvi; and Moritz, Alex, to Ormat Turbines (1965) Ltd. Cascaded power plant using low and medium temperature source fluid. 4,700,543, Cl. 60-655.000.

Kringe, Horst, to U.S. Philips Corporation. Arrangement for controlling the level of an ink container. 4,700,754, Cl. 141-95.000.

Kristal Instruments AG: *See—*
Baumgartner, Hans-Ulrich; Calderara, Reto; and Sonderegger, Hans-Conrad, 4,701,660, Cl. 310-338.000.

Kristen, Ulrich: *See—*
Brady, Arthur; Kristen, Ulrich; Angerer, Hermann F.; and Regenass, Franz, 4,701,273, Cl. 252-32.500.

KRKA, tovarna zdravil, n.sol.o.: *See—*
Kobe, Joze; Gnidovec, Joze; and Zupet, Pavle, 4,701,526, Cl. 544-251.000.

Kroetsch, Karl P.; and Wolf, Peter G., to General Motors Corporation. Detachable clamp for fixturing heat exchanger core assemblies for brazing in combination with the heat exchanger core. 4,700,469, Cl. 29-726.000.

Kroll, Quin D.: *See—*
Frese, John J.; and Kroll, Quin D., 4,700,738, Cl. 137-412.000.

Krueger, Steven: *See—*
Curtin, William J.; Soto, Stephen; and Krueger, Steven, 4,701,950, Cl. 379-214.000.

Kruger, Gustav, to Feinmetall GmbH. Contact pin having a spring under tension. 4,701,702, Cl. 324-158.00P.

Krumme, John F.: *See—*
Carter, Philip S.; and Krumme, John F., 4,701,587, Cl. 219-10.750.

Kubiak, Robert E., to Foxcraft, Inc. Tree step. 4,700,807, Cl. 182-92.000.

Kuboki, Shigeo; Masuda, Ikuro; Masuda, Toshiaki; and Hayashi, Terumine, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Integrated circuit device. 4,701,922, Cl. 371-25.000.

Kuboyama, Haruhiro: *See—*
Yamamoto, Junko; Fujimoto, Kyohei; Hirasawa, Kazuhiro; and Kuboyama, Haruhiro, 4,701,763, Cl. 343-700.0MS.

Kudo, Koji: *See—*
Satou, Kazuhiro; Kudo, Koji; Maruyama, Masanori; Mimura, Itaru; and Nagahara, Shusaku, 4,701,679, Cl. 315-383.000.

Kudo, Mitsuhiro: *See—*
Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, 4,701,819, Cl. 360-122.000.

Kudo, Takumi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Supporting structure for fuel feeding gun in fuel tank. 4,700,757, Cl. 141-311.00R.

Kuehn, Monika: *See—*
Schuck, Helmut; Foerster, Karl-Heinz; Kuehn, Monika; and Schanze, Klaus, 4,701,757, Cl. 340-825.060.

Kuhn, Jakob: *See—*
Rohr, Thomas-Markus; and Kuhn, Jakob, 4,701,525, Cl. 534-678.000.

Kuhnelt, Herbert: *See—*
Bauer, Friedrich; and Kuhnelt, Herbert, 4,700,610, Cl. 91-390.000.

Kumasaka, Noriyuki: *See—*
Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, 4,701,819, Cl. 360-122.000.

Kumasaka, Toru; Ohya, Toshikazu; and Kamiji, Koichi, to NEC Home Electronics Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Circuit for supervising contact for passenger protective device. 4,701,628, Cl. 307-9.000.

Kumashiro, Kenji: *See—*
Iijima, Toshifumi; Yamada, Yoshitaka; Kumashiro, Kenji; Kamio, Takashi; and Shimura, Shinya, 4,701,404, Cl. 430-559.000.

Kump, William H.; and Jergl, Joseph J., to GNB Incorporated. Battery comprising dual terminal bushings. 4,701,386, Cl. 429-179.000.

Kunze, Michael: *See—*
Segal, Marcos; and Kunze, Michael, 4,701,523, Cl. 534-634.000.

Kupferschmidt, Albert; Greene, Tracy D.; and Jaycox, Donald F., to Northern Telecom Limited. Pole mounting connector. 4,700,995, Cl. 439-276.000.

Kurachi, Hisao; Minaminaka, Kazuyoshi; Ito, Takeo; and Yamakawa, Kiyoshi, to Brother Kogyo Kabushiki Kaisha. Data entry keyboard. 4,701,579, Cl. 200-5.00A.

Kuraoka, Koji; Umeda, Morio; Konishi, Takeshi; and Tuchiya, Takanori, to Mazda Motor Corporation. Open-top vehicle having a power operated roof structure. 4,700,982, Cl. 296-107.000.

Kurata, Masaru: *See—*
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyu'ti; Kaji, Isao; Hasegawa, Masakazu; Tan, Masayuki; and Kurata, Masaru, 4,701,117, Cl. 425-116.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, 4,701,495, Cl. 525-75.000.

Kurita, Kazuo; and Ishihara, Hideaki, to Toyo Boseki Kabushiki Kaisha. Polyamide fibers having improved properties, and their production. 4,701,377, Cl. 428-364.000.

Kurobe, Atsushi: *See—*
McIlroy, Paul W. A.; Kurobe, Atsushi; and Furuyama, Hideto, 4,701,774, Cl. 357-17.000.

Kuroiwa, Yosio; and Sibata, Takuo, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for external broaching of resin-coated parts. 4,701,085, Cl. 409-244.000.

Kurtzman, Myron B.: *See—*
Agapiou, Agapios K.; Muhle, Michael E.; and Kurtzman, Myron B., 4,701,506, Cl. 526-128.000.

Kuswa, Glenn W.: *See—*
Benson, David A.; and Kuswa, Glenn W., 4,700,629, Cl. 102-201.000.

Kut Kwick Corporation: *See—*
Torras, Robert M., 4,700,536, Cl. 56-15.800.

Kutukhtin, Evgeny G.: *See—*
Martyshenko, Jury P.; Martyshenko, Sergei J.; Kotelnikov, Jury S.; Kutukhtin, Evgeny G.; Ilyasova, Nelli I.; Volkov, Jury S.; Vardanian, Armenak M.; and Petrosian, Misha S., 4,701,075, Cl. 405-217.000.

Kuusela, Juhani; Lopperi, Esko; Lummila, Markku; Saksala, Pertti; Salovaara, Esa; Suhonen, Tuomo; Perttina, Harri; Poikolainen, Esko; and Trygg, Hannu, to Oy Safematic Ltd. Slide-ring seal. 4,700,953, Cl. 277-38.000.

Kuwahara, Hideyuki; Kondo, Bunji; Takada, Jun; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, to Japan Synthetic Rubber Co., Ltd.; and Applied Science Research Institute. Process for producing an internal-oxidized alloy or a shaped article thereof. 4,701,301, Cl. 419-21.000.

Kuyper, Mark E.: *See—*
Drews, Reinhold A.; Jautakis, Karl; and Kuyper, Mark E., 4,700,495, Cl. 34-133.000.

Kuypers, Leonardus P. C.; and Wolters, Gerrit, to Akzo N.V. Method for the immunochemical determination of hepatitis B core antigens. 4,701,410, Cl. 435-7.000.

Kuypers, Leonardus P. C.; and Matthyssen, Ludovicus F. T., to Akzo, N.V. Determination of protecting anti-HBV immunoglobulins. 4,701,421, Cl. 436-518.000.

Kyocera Corporation: *See—*
Fujikawa, Nobuyoshi; Kawaminami, Syuichi; and Yokoe, Nobuo, 4,701,827, Cl. 361-309.000.
Nishiguchi, Yasuo; Minami, Keijirou; and Hoda, Masakazu, 4,701,769, Cl. 346-76.0PH.

La Telemecanique Electrique: *See—*
Eschermann, Guy; and Lemarquand, Pierre, 4,701,067, Cl. 403-326.000.

Lachenmeier, Timothy T.; and Howard, Christian S. Method and apparatus for playing a game. 4,700,951, Cl. 273-264.000.

Lachish, Uri: *See—*
El-Hanany, Uri; Lachish, Uri; Rotter, Shlomo; and Adler, Eli, 4,701,607, Cl. 250-205.000.

Lacks Industries, Inc.: *See—*
Bramer, Charles, 4,701,037, Cl. 350-634.000.

Lagerstedt, Torgny: *See—*
Inge, Claes; Lagerstedt, Torgny; Borgstroem, Leonard; Carlsson, Claes-Goeran; Naebo, Sven-Olof; Moberg, Hans; and Franzen, Peter, 4,701,158, Cl. 494-74.000.

Lagree, James L.; and Elms, Robert T., to North American Philips Lighting Corp. Ballast adaptor for improving operation of fluorescent lamps. 4,701,673, Cl. 315-244.000.

Lagreze, Richard; and Malescot, Georges, to Societe Nationale des Poudres et Explosifs. Process for the manufacture of a double-base propellent composition with low flame-glare emission. 4,701,228, Cl. 149-109.600.

Lahm, Heinrich, to Index-Werke Komm.-Ges. Hahn & Tessky. Tool changing apparatus for a machine tool. 4,700,442, Cl. 29-39.000.

Lamb Technicon Corp.: *See—*
Lunn, Garfield R., 4,700,936, Cl. 269-226.000.

Lamont, Peter; Monroe, Carl M.; and Skostins, Olgerts, to Dow Corning Corporation. Silicone extrusion stock. 4,701,491, Cl. 524-493.000.

Landers, Samuel P., to Goodyear Tire & Rubber Company, The. Pneumatic tire therad with wide central groove and arcuate grooves. 4,700,762, Cl. 152-209.00R.

Landis, James K.: *See—*
Bass, Vance R.; Bonebrake, Veronica A.; Garrison, David A.; Landis, James K.; Neff, Mary S.; Urquhart, Robert J.; and Williams, Susan C., 4,701,851, Cl. 364-419.000.

Lane, Parley C., Jr.: *See—*
Minchak, Robert J.; and Lane, Parley C., Jr., 4,701,510, Cl. 526-283.000.

Lane, Wendell C., Jr., to Dana Corporation. Multi-clevis cable connector. 4,700,828, Cl. 206-223.000.

Langlitz, Karlheinz; and Schnitz, Guenter, to Mannesmann AG. Mounting a metallurgical vessel. 4,700,929, Cl. 266-246.000.

Langner, Carl G., to Shell Oil Company. Directional drilling pipelay. 4,700,788, Cl. 175-61.000.

Lanzer, Heribert: *See—*
Friedrich, Karl; and Lanzer, Heribert, 4,700,800, Cl. 180-249.000.

Lapadakis, Theodore P. Paper tape control unit. 4,700,906, Cl. 242-67.30R.

Lars, Eriksson. Chassis. 4,700,959, Cl. 280-791.00R.

Larson, Byron A.; and Molteni, John J. Apparatus for repairing deformed, yieldable structures. 4,700,559, Cl. 72-461.000.

Larsonneur, Lionel M., to Paper-Pak Products, Inc. Method and apparatus for fabricating three-fold pads. 4,701,156, Cl. 493-418.000.

Larsson, Jan S., to Tekno-Detaljer Lindstrom & Waerme AB. Method and apparatus for heat treating coiled springs. 4,701,589, Cl. 219-50.000.

Larue, Roderick W.; Aebersold, Werner; and Eckel, Robert, to Becton, Dickinson and Company. Mercury arc lamp suitable for inclusion in a flow cytometry apparatus. 4,701,664, Cl. 313-112.000.

Laska, Walter A. Corner flashing membrane. 4,700,512, Cl. 52-58.000.

Lasker, Martin L., to Prescolite, Inc. Luminaire for roadway and area lighting. 4,701,832, Cl. 362-281.000.

Lassen, Frederich O., to Kimberly-Clark Corporation. Web with enhanced fluid transfer properties and method of making same. 4,701,237, Cl. 156-252.000.

LaTulip, Randy J.: *See—*
Swearingen, Loren L.; Embrey, Wallace E.; LaTulip, Randy J.; Earls, Jim D.; and McConchie, Garnet E., 4,701,529, Cl. 546-251.000.
Swearingen, Loren L.; and LaTulip, Randy J., 4,701,530, Cl. 546-251.000.

Lau, Jark C.: *See—*
Radwanski, Fred R.; Lau, Jark C.; and Post, James L., 4,701,294, Cl. 264-518.000.

Lau, Jurgen: *See—*
Michalski, Bernhard; Lau, Jurgen; and Berger, Wolfram, 4,700,569, Cl. 73-290.00V.

Laude, David P.; and Noufer, Glenn E., to Ford Microelectronics, Inc. FET gate current limiter circuits. 4,701,643, Cl. 307-450.000.

Laurent, Henry: *See—*
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Toepert, Michael; and Wendt, Hans, 4,701,451, Cl. 514-180.000.

Lawrence, Andre H.; and Elias, Lorne, to Canadian Patents & Development Ltd. Concentrator for detection of amine vapors. 4,701,306, Cl. 422-101.000.

Lawson, John D. Swine farrowing system. 4,700,661, Cl. 119-20.000.

Lazar, Gustav, to Otis Elevator Company. Screwless elevator car assembly. 4,700,809, Cl. 187-1.00R.

Lear Siegler, Inc.: *See—*
Cherry, Herbert J., 4,700,968, Cl. 280-704.000.
Horn, John, 4,700,920, Cl. 248-370.000.

LeaRonal, Inc.: *See—*
Nobel, Fred I.; and Ostrow, Barnet D., 4,701,244, Cl. 204-44.400.

Lechner, Rufolf: *See—*
Oppelt, Herbert; and Lechner, Rufolf, 4,700,905, Cl. 242-67.10R.

Leclere, Klemens: *See—*
Kraemer, Johannes; Leclere, Klemens; Nuding, Werner; and Schilde, Heinz-Josef, 4,701,240, Cl. 156-555.000.

Lederle (Japan), Ltd.: *See—*
Hasegawa, Kenji; Nakashima, Koichi; Eguchi, Tohru; and Ota, Masako, 4,701,320, Cl. 424-54.000.

Lee, Chong R.: *See—*
Un, Chong K.; Ryu, Seung M.; and Lee, Chong R., 4,701,905, Cl. 370-18.000.

Lee, Hyosong M. Device for continuous separation of solid particles from a liquid suspension. 4,701,260, Cl. 210-521.000.

Lee, Mark C.: *See—*
Wang, Taylor G.; Elleman, Daniel D.; Lee, Mark C.; and Kendall, James M., Jr., 4,701,436, Cl. 502-339.000.

Lee, Wu-Long: *See—*
Lee, Yu-Chuan; and Lee, Wu-Long, 4,700,617, Cl. 99-327.000.

Lee, Yu-Chuan; and Lee, Wu-Long. Automatic frying machine. 4,700,617, Cl. 99-327.000.

Leenders, Luc H.; Ramon, Charles L.; and Daems, Edie R., to AGFA-Gevaert N.V. Process for the formation of a linework or halftone multicolor colloid pattern. 4,701,401, Cl. 430-257.000.

Leggett & Platt, Incorporated: *See—*
Mohr, Henry G., 4,700,558, Cl. 72-145.000.
Robinson, Danny C., 4,700,414, Cl. 5-13.000.

Lehrer, Nurit: *See—*
Segal, Ester; and Lehrer, Nurit, 4,701,444, Cl. 514-55.000.

Leiber, Heinz, to Daimler-Benz AG. Propulsion control system for motor vehicles. 4,700,797, Cl. 180-197.000.

Lejus Medical Aktiebolag: *See—*
Appelgren, Curt H., 4,701,341, Cl. 427-3.000.

Le Ludec, Joel; Machurat, Jean; Morawski, Jean-Claude; and Soula, Gerard, to Rhone-Poulenc Chimie de Base. Sulfurized tepa/amido compounds as interface agents for vulcanizable elastomeric matrices. 4,701,492, Cl. 524-493.000.

Lemarquand, Pierre: *See—*
Eschermann, Guy; and Lemarquand, Pierre, 4,701,067, Cl. 403-326.000.

Lenck, Lucien-Charles. Method and apparatus for insemination in vivo and in vitro. 4,701,161, Cl. 604-55.000.

Lentfer, Arno; and Luthje, Holger, to U.S. Philips Corporation. Mask with magnesium diaphragm for X-ray lithography. 4,701,391, Cl. 430-5.000.

Leonardi, Giovanni M.: *See—*
den Hollander, Willem; and Leonardi, Giovanni M., 4,701,793, Cl. 358-140.000.

Le Pesant, Jean-Pierre; Hareng, Michel; Mourey, Bruno; and Perbet, Jean-Noel, to Thomson-CSF. Optical modulator. 4,701,021, Cl. 350-267.000.

Les Cables de Lyon: *See—*
Bonicel, Jean-Pierre, 4,701,014, Cl. 350-96.200.

Lesperance, Pierre. Goalkeeper glove. 4,700,404, Cl. 2-16.000.

Lester, George R.; Gonczy, Stephen T.; Welsh, Lawrence B.; and Stranford, Gerald T., to Allied Corporation. Preparation of silicon nitride powder. 4,701,316, Cl. 423-344.000.

Leuba, Jean-Louis; Meyer, Inge; and Andersen, Else M., to Nestec S.A. Method for dissolving squid membranes. 4,701,339, Cl. 426-643.000.

Leukel, Bernd: *See—*
Weidenauer, Werner; Leukel, Bernd; and Bunk, Klaus, 4,700,879, Cl. 228-123.000.

Leupold, Herbert A., to United States of America, Army. Leakage-free, linearly varying axial permanent magnet field source. 4,701,737, Cl. 335-301.000.

Leuveld, Jozef G. M.: *See—*
Ligtenberg, Hendrikus C. G.; and Leuveld, Jozef G. M., 4,701,253, Cl. 204-416.000.

LeVasseur, Rod: *See—*
Beech, Brian; Rust, Jeff; Meilach, Alan; and LeVasseur, Rod, 4,701,600, Cl. 235-375.000.

Levchenko, Georgy T.; and Radzikovsky, Alexandr N., to Kievsky Politekhnichesky Institut. Evaporator for depositing films in a vacuum. 4,700,660, Cl. 118-726.000.

Lever Brothers Company: *See—*
Doornbos, Tamme; van der Heijden, Arnoldus; van der Kamp, Johannes W.; and de Rooij, Johannes F., 4,701,335, Cl. 426-533.000.
Koermer, Gerald S.; Gutierrez, Eddie N.; and Prorok, Maryfrances, 4,701,527, Cl. 544-277.000.

Levine, Robert A.; and Wardlaw, Stephen C. Device for detecting nocturnal penile erections. 4,700,715, Cl. 128-774.000.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Agricultural ureas and isoureas. 4,701,535, Cl. 549-60.000.

Levy, Alvin C.: *See—*
Gartside, Charles H., III; Levy, Alvin C.; Overton, Bob J.; and Taylor, Carl R., 4,701,016, Cl. 350-96.230.

Lewis, Charles W.: *See—*
Lewis, Irvin H., Jr.; and Lewis, Charles W., 4,700,923, Cl. 248-679.000.

Lewis, Irvin H., Jr.; and Lewis, Charles W. Universal, portable, concrete slab base for pump jacks. 4,700,923, Cl. 248-679.000.

L'Henaff, Patrick; and Bricaud, Herve, to Amphenol Corporation. Miniature fluidic connector. 4,700,743, Cl. 137-560.000.

Li, Ernest L., to Owens-Illinois, Inc. Tamper indicating vacuum package. 4,700,860, Cl. 215-256.000.

Lia, Raymond A.; and Vivenzio, Robert L., to Welch Allyn, Inc. Endoscope steering section. 4,700,693, Cl. 128-4.000.

Libbey-Owens-Ford Co.: *See—*
Baker, Rodney G.; and Lubelski, Daniel P., 4,701,425, Cl. 501-70.000.

Ligtenberg, Hendrikus C. G.; and Leuveld, Jozef G. M., to Sentron v.o.f. ISFET-based measuring device and method for correcting drift. 4,701,253, Cl. 204-416.000.

Liles, Donald T.; and Speier, John L., to Dow Corning Corporation. Method and apparatus for the rapid solidification of molten material in particulate form. 4,701,289, Cl. 264-8.000.

Lim, John C.: *See—*
Jung, Il N.; Cho, Ko D.; Lim, John C.; and Yoo, Bok-Ryul, 4,701,430, Cl. 502-62.000.

Limbert, Michael; Durckheimer, Walter; Schorlemmer, Hans-Ulrich; and Dickneite, Gerhard, to Hoechst Aktiengesellschaft. Use of cephem compounds as immunomodulators. 4,701,452, Cl. 514-206.000.

Lin, Cheng-Fung: *See—*
Wan, Shyue-Yun; Guo, Jeng-Joung; and Lin, Cheng-Fung, 4,701,937, Cl. 375-25.000.

Lin, Shiow C., to W. R. Grace & Co. Novel epoxy hardeners. 4,701,513, Cl. 528-89.000.

Lincoln Foodservice Products, Inc.: *See—*
Bratton, Ronald E.; Gigandet, Richard W.; Henke, Mitchell C.; Kaminski, Daniel S.; and Wibel, Michelle A., 4,701,340, Cl. 426-511.000.
Miller, Ben, 4,700,685, Cl. 126-20.000.

Lindae, Gerhard: *See—*
Glaser, Gerhard; Lindae, Gerhard; Perthus, Peter; and Rein, Heinz, 4,701,834, Cl. 362-307.000.

Lindahl, Thomas G.: *See—*
Gray, Robert R.; and Lindahl, Thomas G., 4,701,126, Cl. 432-58.000.

Linde Aktiengesellschaft: *See—*
Haehn, Peter C., 4,701,190, Cl. 55-49.000.

Lindo, Neil A.: *See—*
Vashi, Dhiru B.; Clark, Jeffrey N.; and Lindo, Neil A., 4,701,447, Cl. 514-85.000.

Lindsay, Deborah J., to Surface Technology, Inc. Process for electroless metal deposition. 4,701,350, Cl. 427-97.000.

Lindsay, Erin J.; and Pittman, John N., to Minnesota Mining and Manufacturing Company. Catheter and method for infusing fluid into a patient. 4,701,160, Cl. 604-53.000.
Linkies, Jurgen: *See—*
Achelpohl, Fritz; Winkler, Gerhard; Tupker, Hermann; and Linkies, Jurgen, 4,701,116, Cl. 425-72.00R.
Linnert, Peter J.: *See—*
Andersen, Garry E.; Quinn, James R.; and Linnert, Peter J., 4,701,114, Cl. 417-564.000.
Litton Systems, Inc.: *See—*
Hagberg, Calvin A., 4,701,586, Cl. 219-10.55R.
Litzinger, Elmer: *See—*
Korte, Kevin R.; Litzinger, Elmer; and Wu, Dan T., 4,700,722, Cl. 131-309.000.
Locke, David R.; and Miska, Aivars, to Remington Products, Inc. Shaver for a medical treatment preparation procedure. 4,700,476, Cl. 30-43.910.
Loeffler, William R.: *See—*
Tibbals, Edward C., Jr., 4,700,581, Cl. 74-198.000.
Loftus, Frank, to Imperial Chemical Industries PLC. Substituted cyanamide compounds useful for the manufacture of cephalosporin derivatives. 4,701,556, Cl. 564-106.000.
Logan Western Road, Inc.: *See—*
Berry, Vernon D., 4,700,786, Cl. 172-799.500.
Logical Services, Inc.: *See—*
Nichols, John L., 4,701,847, Cl. 364-200.000.
Lohrenz, Marold H.; Thies, Joel O.; and Jednacz, Scott T., to Telex Computer Products, Inc. Tape deck having improved tape path. 4,700,909, Cl. 242-182.000.
Loi, Chay H., to Nearly Me. Method for manufacturing a breast prosthesis. 4,701,230, Cl. 156-145.000.
Looper, David W.: *See—*
Frey, Emory L.; Looper, David W.; and Daunis, Eugene J., 4,700,567, Cl. 73-151.000.
Loose, Joachim, to Cetus Corporation. Blind label. 4,700,976, Cl. 283-101.000.
LOPAT Enterprises, Inc.: *See—*
Davis, Lincoln R.; and Flax, Louis, 4,700,986, Cl. 297-157.000.
Lopez, Conrad S. Toilet flushing mechanism with high/low water volume selectability. 4,700,413, Cl. 4-324.000.
Lopperi, Esko: *See—*
Kuusela, Juhani; Lopperi, Esko; Lummila, Markku; Saksala, Pertti; Salovaara, Esa; Suhonen, Tuomo; Perttina, Harri; Poikolainen, Esko; and Trygg, Hannu, 4,700,953, Cl. 277-38.000.
Lorenz, Kurt; Dungs, Horst; and Auge, Karl-Hans, to Carl Still GmbH & Co. KG, Firma. Method for cooling and dedusting dry cooled coke. 4,701,243, Cl. 201-3.000.
Los, Marinus, to American Cyanamid Company. Dihydroimidazopyrrolopyridine, quinoline, thieno- and furo[2,3-b]pyridine, dihydrothieno- and furo[2,3-b]-pyridine, thieno- and furo[3,2-b]pyridine and dihydrothieno- and furo[3,2-b]pyridine herbicides and method for preparation thereof. 4,701,208, Cl. 71-92.000.
Loucks, Bryan E., to Greyhawk Systems, Inc. Apparatus for mounting two lasers to produce parallel or colinear beams. 4,701,018, Cl. 350-174.000.
Loucks, Joseph, Jr., executor: *See—*
Loucks, Joseph, Sr., deceased; and Loucks, Joseph, Jr., executor, 4,701,471, Cl. 514-847.000.
Loucks, Joseph, Sr., deceased; and by Loucks, Joseph, Jr., executor. Skin care composition. 4,701,471, Cl. 514-847.000.
Loverro, Nicholas P., Jr. Ammonium nitrate explosive compositions. 4,701,227, Cl. 149-47.000.
Lubbers, Dietrich W.; and Opitz, Norbert, to Max Planck Gesellschaft. Arrangement for measuring potential differences. 4,701,697, Cl. 324-96.000.
Lubelski, Daniel P.: *See—*
Baker, Rodney G.; and Lubelski, Daniel P., 4,701,425, Cl. 501-70.000.
Luc Technologies Limited: *See—*
Dodds, Ralph G.; and Ryan, Patrick B., 4,700,877, Cl. 228-2.000.
Lucas Industries public limited company: *See—*
Rath, Heinrich B., 4,700,813, Cl. 188-18.00A.
Rath, Heinrich-Bernhard, 4,700,816, Cl. 188-323.000.
Reynolds, Desmond H. J., 4,700,990, Cl. 303-9.690.
Lucas, Peter A.: *See—*
Bogan, Gary W.; Lucas, Peter A.; and Monnerat, Georgia A., 4,701,481, Cl. 523-428.000.
Luccarelli, Domenick, Jr.: *See—*
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Miller, Kevin P.; and Wiener, Charles, 4,701,548, Cl. 560-152.000.
Luceri, Thomas J.: *See—*
Glaug, Frank S.; Luceri, Thomas J.; and Parr, Deborah J., 4,701,178, Cl. 604-387.000.
Luchinger, Paul, to Mettler Instrumente AG. Precision balance. 4,700,793, Cl. 177-181.000.
Lucius, Werner; Mosig, Ernst; and Riedmaier, Josef, to Webasto-Werk W. Baier GmbH & Co. Connecting device for power supply and heater equipped therewith. 4,700,889, Cl. 237-12.30C.
Ludwig, Keith A.: *See—*
Bennett, Douglas L.; Ludwig, Keith A.; and Schwarz, Alexander, 4,700,771, Cl. 165-1.000.
Luers, Thomas J., to Halliburton Company. Gravel packing apparatus and method. 4,700,777, Cl. 166-185.000.
Luk Lamellen und Kupplungsbau GmbH: *See—*
Maucher, Paul; and Honemann, Rudolf, 4,700,821, Cl. 192-106.200.
Maucher, Paul; and Honemann, Rudolf, 4,700,822, Cl. 192-106.200.
Lukac, Teodor; Soukup, Milan; and Widmer, Erich, to Hoffmann-La Roche Inc. Process for carotenoid intermediates. 4,701,540, Cl. 549-341.000.
Lum, Kin K.: *See—*
Weaver, Max A.; Moore, William H.; and Lum, Kin K., 4,701,439, Cl. 503-227.000.
Lummila, Markku: *See—*
Kuusela, Juhani; Lopperi, Esko; Lummila, Markku; Saksala, Pertti; Salovaara, Esa; Suhonen, Tuomo; Perttina, Harri; Poikolainen, Esko; and Trygg, Hannu, 4,700,953, Cl. 277-38.000.
Lunn, Garfield R., to Lamb Technicon Corp. Clamp mechanism. 4,700,936, Cl. 269-226.000.
Luthje, Holger: *See—*
Lentfer, Arno; and Luthje, Holger, 4,701,391, Cl. 430-5.000.
Lux, Peter: *See—*
Eibert, Max; Lux, Peter; and Metzdorf, Walter, 4,701,047, Cl. 356-1.000.
Luzin, Valery V.: *See—*
Volkhin, Nikolai N.; Ardabatsky, Vladimir P.; and Luzin, Valery V., 4,700,468, Cl. 29-623.200.
Lynch, Daniel; and Perry, Steven B., to Keptel, Inc. Frequency responsive party telephone line selection apparatus and method. 4,701,949, Cl. 379-179.000.
Lynch, Jerry C.: *See—*
Faler, Gary R.; and Lynch, Jerry C., 4,701,566, Cl. 568-719.000.
M & S Engineering and Manufacturing Co., Inc.: *See—*
Przewalski, Zygmunt J., 4,700,638, Cl. 110-346.000.
M-Scan Limited: *See—*
Morris, Howard R., 4,701,419, Cl. 436-89.000.
Maas, Lawrence W.; Geiman, Richard A.; and Adams, Charles T., to Shell Oil Company. Static bed wax decolorization process. 4,701,254, Cl. 208-26.000.
MacDermid, Incorporated: *See—*
Grunwald, John J.; and Spencer, Allen C., 4,701,390, Cl. 430-325.000.
Machizuki, Hiroyuki: *See—*
Tamaki, Shigenori; Machizuki, Hiroyuki; Kobayashi, Nobuo; Iwase, Takahiro; and Masuda, Naofumi, 4,701,346, Cl. 427-46.000.
Machurat, Jean: *See—*
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MacPherson, Duncan, to Hughes Aircraft Company. System and method for mapping geosynchronous real image data into idealized images. 4,701,791, Cl. 358-109.000.
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Thompson, Michael D.; and Madding, Gary D., 4,701,528, Cl. 544-278.000.
Madeley, John N., to TRW Inc. Electrical connector component. 4,701,136, Cl. 439-76.000.
Mader, James M., to Harris Corporation. Integrated circuit architecture formed of parametric macro-cells. 4,701,860, Cl. 364-490.000.
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Madokoro, Shinichi: *See—*
Sakamoto, Yukio; Madokoro, Shinichi; and Okuyama, Shingo, 4,700,440, Cl. 29-25.420.
Maeda, Tatsuo: *See—*
Morimoto, Teruyo; Sano, Yumiko; Nimura, Eiji; Tomii, Yuji; and Maeda, Tatsuo, 4,701,389, Cl. 430-110.000.
Maeda, Umio: *See—*
Kawakatsu, Akira; Yuge, Yooji; Hayama, Noriyuki; Saito, Tokuyoshi; and Maeda, Umio, 4,701,663, Cl. 313-112.000.
Maedge, Werner: *See—*
Wysk, Hans-Joachim; Stellmach, Dieter; Nolte, Bernhard; Gronwald, Gerd; and Maedge, Werner, 4,701,063, Cl. 400-621.000.
Maemine, Kenji, to Alps Electric Co., Ltd. Brushless motor with symmetrical leads for preventing signal distortion. 4,701,649, Cl. 310-68.00R.
Maemine, Kenji, to Alps Electric Co., Ltd. Brushless motor with phase cancelling leads for rotational speed detector pattern. 4,701,650, Cl. 310-68.00R.
Maeshima, Katsuyoshi, to Canon Kabushiki Kaisha. Image processing system with real time image process. 4,701,805, Cl. 358-282.000.
Maghon, Helmut; and Becker, Bernard, to Kraftwerk Union Aktiengesellschaft. Combustion chamber apparatus for combustion installations, especially for combustion chambers of gas turbine installations, and a method of operating the same. 4,701,124, Cl. 431-284.000.
Magnetic Peripherals Inc.: *See—*
Gitzendanner, Louis G., 4,701,818, Cl. 360-106.000.
Magnier, Pierre: *See—*
Broihanne, Georges; and Magnier, Pierre, 4,700,768, Cl. 164-361.000.
Maguire, Walter R.: *See—*
Allebest, Edward F.; Hansen, Parley E.; Walsh, George A.; and Maguire, Walter R., 4,701,896, Cl. 369-32.000.
MAHO Aktiengesellschaft: *See—*
Babel, Werner, 4,700,452, Cl. 29-568.000.
Maier, Hans-Peter: *See—*
von der Eltz, Hans-Ulrich; Maier, Hans-Peter; and Rostermundt, Karl-Heinz, 4,701,182, Cl. 8-533.000.
Mainz, Klaus: *See—*
Ehemann, Gero; and Mainz, Klaus, 4,700,975, Cl. 280-824.000.

Malchow, Gregory L.: *See*—
Werner, Kurt; Malchow, Gregory L.; Carr, Keith E.; and Brenner, Robert A., 4,700,492, Cl. 34-32.000.

Malcombe, Jean-Claude, to Societe de Maintenance Electronique "SOMELEC". Miniature high-gain antenna. 4,701,764, Cl. 343-742.000.

Malescot, Georges: *See*—
Lagreze, Richard; and Malescot, Georges, 4,701,228, Cl. 149-109.600.

Malhotra, Shadi L., to Xerox Corporation. Coatings for typewriter transparencies. 4,701,367, Cl. 428-216.000.

Mallett, A. J.; and Minear, John W., to Halliburton Company. Transducer forming compression and shear waves for use in acoustic well logging. 4,700,803, Cl. 181-106.000.

Mallinckrodt, Inc.: *See*—
Dutton, Edmund L.; Selfridge, Glenn D.; and Tipton, Russell C., 4,701,415, Cl. 435-289.000.

Malloy, James T., to Hinderstein, Philip M., a part interest. Bed-of-pins test fixture. 4,701,703, Cl. 324-158.00F.

Manalastas, Pacifico V.: *See*—
Duvdevani, Ilan; Manalastas, Pacifico V.; Drake, Evelyn N.; and Thaler, Warren A., 4,701,204, Cl. 71-28.000.

Manco, Giuseppe: *See*—
Fossati, Giorgio; Terry, Harold; and Manco, Giuseppe, 4,700,748, Cl. 137-877.000.

Mang, Warren G.: *See*—
Giatras, James L.; Mang, Warren G.; Marino, Charles P.; Needling, Michael C.; and Pezdirtz, George F., 4,701,345, Cl. 427-45.100.

Mannesmann AG: *See*—
Langlitz, Karlheinz; and Schnitz, Guenter, 4,700,929, Cl. 266-246.000.

Mannesmann Aktiengesellschaft: *See*—
Gruner, Manfred, 4,701,685, Cl. 318-309.000.
Wysk, Hans-Joachim; Stellmach, Dieter; Nolte, Bernhard; Gronwald, Gerd; and Maedge, Werner, 4,701,063, Cl. 400-621.000.

Mannion, Catharine: *See*—
Nelsen, Charles E.; and Mannion, Catharine, 4,701,326, Cl. 424-408.000.

Manteufel, Rolf P. C. Apparatus for the exchange of material and/or heat between and/or for mixing of gaseous and/or liquid substances. 4,701,287, Cl. 261-81.000.

Manuel, John L., to Allred, Gary. Universal trap. 4,700,412, Cl. 4-207.000.

Manufacture d'Appareillage Electrique de Cahors: *See*—
Bourrieres, Pierre, 4,701,577, Cl. 174-45.00R.

Marchand, Michel: *See*—
Jurczyszyn, Michel; and Marchand, Michel, 4,701,013, Cl. 350-96.200.

Marchio , Fabio; and Menniti, Pietro, to SGS Microelettronica S.p.A. Antisaturation circuit for integrated PNP transistor. 4,701,638, Cl. 307-300.000.

Margolis, Geoffrey; Mercier, Alain; and Schlecht, Klaus, to Nestec S.A. Process for extracting roasted and ground coffee. 4,701,333, Cl. 426-432.000.

Marino, Charles P.: *See*—
Giatras, James L.; Mang, Warren G.; Marino, Charles P.; Needling, Michael C.; and Pezdirtz, George F., 4,701,345, Cl. 427-45.100.

Mark Industries, Inc.: *See*—
Mims, Charles R., 4,701,188, Cl. 55-20.000.

Markel Corporation: *See*—
Giatras, James L.; Mang, Warren G.; Marino, Charles P.; Needling, Michael C.; and Pezdirtz, George F., 4,701,345, Cl. 427-45.100.

Markusch, Peter H.; Rosthauser, James W.; and Tirpak, Robin E., to Mobay Corporation. Stable, aqueous dispersions of polyurethane-ureas. 4,701,480, Cl. 523-340.000.

Marlen Research Corporation: *See*—
Powers, Richard G.; Schack, Warren R.; Alley, Lewis F.; and Anderson, James E., 4,700,899, Cl. 241-30.000.

Marley Cooling Tower Company, The: *See*—
Bugler, Thomas W., III, 4,700,893, Cl. 239-498.000.

Marshall, Clarence F.: *See*—
Peters, Stanley T.; Kolek, Robert L.; Guenther, Rolf A.; Anderson, Jeffrey J.; and Marshall, Clarence F., 4,701,231, Cl. 156-172.000.

Marshall, Kenneth M.: *See*—
Dean, Arthur L.; Kraft, Robert E.; and Marshall, Kenneth M., 4,701,647, Cl. 310-29.000.

Marshall, Ralph C.: *See*—
Davis, Christopher L.; Davis, Karlean M.; and Marshall, Ralph C., 4,700,695, Cl. 128-25.00R.

Martin, Russell J.: *See*—
Wiebe, Kenneth J.; Harwood, J. Richard; and Martin, Russell J., 4,700,784, Cl. 172-126.000.

Martin, William J.; and Chun, John M., to Whirlpool Corporation. Quick release wand for cannister vacuum cleaner. 4,700,429, Cl. 15-377.000.

Martin, William J., to Motorola, Inc. Injection switch and directional coupler. 4,701,724, Cl. 333-103.000.

Martinez, Antonio, to Conitex, Inc. Product for preventing yarn tail breakage during yarn winding. 4,700,834, Cl. 206-388.000.

Martinez, Antonio, to Conitex, Inc. Method for preventing yarn tail breakage during yarn winding. 4,700,904, Cl. 242-18.00R.

Martino, Louis I.: *See*—
Gambuti, Patrick F.; and Martino, Louis I., 4,701,627, Cl. 296-21.000.

Marty, Garry R., to Masco Corporation of Indiana. Valve assembly. 4,700,928, Cl. 251-310.000.

Martyshenko, Jury P.; Martyshenko, Sergei J.; Kotelnikov, Jury S.; Kutukhtin, Evgeny G.; Ilyasova, Nelli I.; Volkov, Jury S.; Vardanian, Armenak M.; and Petrosian, Misha S., to Novolipetsky Politekhnichersky Institut Imeni Leninskogo Komsomola Belorusii. Reinforced concrete offshore platform. 4,701,075, Cl. 405-217.000.

Martyshenko, Sergei J.: *See*—
Martyshenko, Jury P.; Martyshenko, Sergei J.; Kotelnikov, Jury S.; Kutukhtin, Evgeny G.; Ilyasova, Nelli I.; Volkov, Jury S.; Vardanian, Armenak M.; and Petrosian, Misha S., 4,701,075, Cl. 405-217.000.

Maruyama, Masanori: *See*—
Oku, Kentaro; Fukushima, Masakazu; Suzuki, Hitomi; and Maruyama, Masanori, 4,701,668, Cl. 315-17.000.
Satou, Kazuhiro; Kudo, Koji; Maruyama, Masanori; Mimura, Itaru; and Nagahara, Shusaku, 4,701,679, Cl. 315-383.000.

Marzhauser, Heinz, to Gebr. Marzhauser Wetzlar oHG. Drive for the compound stage of a microscope or similar apparatus. 4,700,585, Cl. 74-479.000.

Masaitis, William: *See*—
Kaiser, Bruce J.; Walker, Edward S.; Tunnell, George W.; and Masaitis, William, 4,701,621, Cl. 250-435.000.

Masaki, Kazumi, to Ken Hayashibara. Apparatus for limiting arc discharge current in incandescent lamp. 4,701,675, Cl. 315-310.000.

Masaki, Takeshi; Kawata, Koichi; Sakagaito, Yukuo; Yamaguchi, Katsumasa; Kinoshiro, Hiromichi; and Toba, Hiroto, to Matsushita Electric Industrial Co., Ltd. Apparatus for processing multiple workpieces utilizing a single laser beam source. 4,701,591, Cl. 219-121.0LT.

Masclaux, Pierre, to Compagnie Generale des Etablissements Michelin. Radial carcass pneumatic tire having two bead rings per bead. 4,700,765, Cl. 152-545.000.

Masco Corporation of Indiana: *See*—
Marty, Garry R., 4,700,928, Cl. 251-310.000.

Mason, James M.: *See*—
Cain, Jerry T.; Mason, James M.; and Rainey, Tommy D., 4,701,087, Cl. 410-94.000.

Mason, Ronald F.; Scholes, Gary; and van Reijendam, Jan W., to Shell Oil Company. Azetidine derivative. 4,701,534, Cl. 548-950.000.

Masonite Corporation: *See*—
Janiga, Eugene R., 4,701,383, Cl. 428-527.000.

Massachusetts Institute of Technology: *See*—
Choi, Hong-Kyun; and Tsaur, Bor-Yeu, 4,700,461, Cl. 437-41.000.
Whitesides, George M.; Crans, Debbie C.; and Kazlaukas, Romas J., 4,701,285, Cl. 260-545.00P.

Masuda, Ikuro: *See*—
Kuboki, Shigeo; Masuda, Ikuro; Masuda, Toshiaki; and Hayashi, Terumine, 4,701,922, Cl. 371-25.000.

Masuda, Katsuhiko: *See*—
Fuke, Akira; Tokita, Yasuhiro; and Masuda, Katsuhiko, 4,701,925, Cl. 372-38.000.

Masuda, Naofumi: *See*—
Tamaki, Shigenori; Machizuki, Hiroyuki; Kobayashi, Nobuo; Iwase, Takahiro; and Masuda, Naofumi, 4,701,346, Cl. 427-46.000.

Masuda, Toshiaki: *See*—
Kuboki, Shigeo; Masuda, Ikuro; Masuda, Toshiaki; and Hayashi, Terumine, 4,701,922, Cl. 371-25.000.

Masuhara, Toshiaki: *See*—
Aoki, Masakazu; Horiguchi, Masashi; Nakagome, Yoshinobu; Ikenaga, Shinichi; Shimohigashi, Katsuhiro; Masuhara, Toshiaki; Itoh, Kiyoo; Nakamura, Hideo; and Minato, Osamu, 4,701,884, Cl. 365-189.000.

Masumoto, Hisayuki, to Minolta Camera Kabushiki Kaisha. Variable focal length lens system. 4,701,033, Cl. 350-425.000.

Mate, Robert D.; Parker, Dane K.; and Blackwell, James C., to Goodyear Tire & Rubber Company, The. Process for the incorporation of functionalized monomers. 4,701,507, Cl. 526-208.000.

Mathevon, Paul: *See*—
Vere, Bernard; and Mathevon, Paul, 4,700,824, Cl. 198-346.200.

Matix-Industries: *See*—
Prasil, Bernard; and Turbe, Jean-Pierre, 4,700,564, Cl. 73-146.000.
Turbe, Jean-Pierre, 4,700,574, Cl. 73-636.000.

Matsubara, Susumu: *See*—
Hasegawa, Norio; Fujino, Toyomi; and Matsubara, Susumu, 4,701,900, Cl. 369-36.000.

Matsuda, Hiroto: *See*—
Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, 4,701,766, Cl. 346-1.100.

Matsuda, Toshiro, to Nissan Motor Company, Limited. Method and system for performing fail-safe operation for anti-skid automotive brake control system having a plurality of controllers independently operable to others. 4,701,854, Cl. 364-426.000.

Matsukawa, Takayuki, to Mitsubishi Denki Kabushiki Kaisha. Method of making multilayer capacitor memory device. 4,700,457, Cl. 437-52.000.

Matsumoto, Haruyuki: *See*—
Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, 4,701,766, Cl. 346-1.100.

Matsumoto, Keiichi: *See*—
Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, 4,701,902, Cl. 369-77.100.

Matsumoto, Kozo: *See*—
Ueda, Sigel; Matsumoto, Kozo; Kanaiwa, Kiyoshi; and Adachi, Muneo, 4,701,746, Cl. 340-347.0DD.
Matsuo, Junichi; Sakano, Kozaburo; and Takeda, Isamu, to Toyo Seikan Kaisha, Ltd. Liquid transfusing bottle. 4,700,871, Cl. 222-107.000.
Matsuo, Tamotsu: *See*—
Koishi, Kenji; and Matsuo, Tamotsu, 4,701,609, Cl. 250-205.000.
Matsuoka, Genya: *See*—
Okumura, Masahide; Matsuzaka, Takashi; Matsuoka, Genya; and Saitou, Norio, 4,701,620, Cl. 250-398.000.
Matsuoka, Hiroki; Morimura, Atsushi; and Kitamura, Yoshinori, to Matsushita Electric Industrial Co., Ltd. Pixel defect correction apparatus. 4,701,784, Cl. 358-213.170.
Matsushima, Yuichi: *See*—
Akiba, Shigeyuki; Utaka, Katsuyuki; Sakai, Kazuo; and Matsushima, Yuichi, 4,701,930, Cl. 372-96.000.
Matsushita, Akira, to Kabushiki Kaisha Toshiba. Apparatus for correcting cyclic code data stored in memory and method therefor. 4,701,914, Cl. 371-13.000.
Matsushita Electric Industrial Co. Ltd.: *See*—
Ikemoto, Yoshihiro; Kataoka, Jiro; Otsuki, Toshinori; and Nakamura, Takuji, 4,701,810, Cl. 358-296.000.
Ito, Akio; Mochizuki, Hideaki; Sunohara, Masaaki; and Tamura, Tooru, 4,701,770, Cl. 346-135.100.
Koishi, Kenji; and Matsuo, Tamotsu, 4,701,609, Cl. 250-205.000.
Matsuoka, Hiroki; Morimura, Atsushi; and Kitamura, Yoshinori, 4,701,784, Cl. 358-213.170.
Oita, Masahiro, 4,701,252, Cl. 204-402.000.
Yamamoto, Junko; Fujimoto, Kyohei; Hirasawa, Kazuhiro; and Kuboyama, Haruhiro, 4,701,763, Cl. 343-700.0MS.
Matsushita Electric Industrial Co., Ltd: *See*—
Masaki, Takeshi; Kawata, Koichi; Sakagaito, Yukuo; Yamaguchi, Katsumasa; Kinoshiro, Hiromichi; and Toba, Hiroto, 4,701,591, Cl. 219-121.0LT.
Matsushita Electric Works, Ltd.: *See*—
Okutsu, Hideo; Mikami, Koushirou; Yonezawa, Kazuyoshi; and Ichikawa, Kuniharu, 4,701,595, Cl. 219-364.000.
Matsushita Electronics Corporation: *See*—
Ashizaki, Shigeya; Sugahara, Koichi; Muranishi, Hideo; and Natsuhara, Masao, 4,701,677, Cl. 315-382.000.
Matsushita, Yukio, to Sanshin Kogyo Kabushiki Kaisha. Internal combustion engine provided with fuel injection device. 4,700,671, Cl. 123-198.00C.
Matsuura, Hideji: *See*—
Kato, Noboru; Matsuura, Hideji; and Umemura, Shinichiro, 4,701,830, Cl. 361-395.000.
Matsuyama, Takayoshi; and Kobayashi, Kenichi, to Fujitsu Limited. Inspecting method and apparatus for a photomask pattern. 4,701,859, Cl. 364-490.000.
Matsuyama, Yoshihiko: *See*—
Kobayashi, Shunsuke; Matsuyama, Yoshihiko; and Koutake, Masayoshi, 4,701,024, Cl. 350-331.00R.
Matsuzaka, Takashi: *See*—
Okumura, Masahide; Matsuzaka, Takashi; Matsuoka, Genya; and Saitou, Norio, 4,701,620, Cl. 250-398.000.
Mattei, Riccardo; and Brizzi, Marco, to G.D Societa' per Azioni. Method for forming incomplete groups of cigarettes in a cigarette packeting machine. 4,700,825, Cl. 198-419.000.
Mattes, Bernhard: *See*—
Gademann, Lothar; Mattes, Bernhard; Mausner, Eberhard; Suchowerskyj, Wadym; and Rittmannsberger, Norbert, 4,700,973, Cl. 280-735.000.
Matteson, Donald S., to Washington State University Research Foundation, Inc. Preparation of α,α-dihaloalkyl boronic esters. 4,701,545, Cl. 558-298.000.
Matthyssen, Ludovicus F. T.: *See*—
Kuypers, Leonardus P. C.; and Matthyssen, Ludovicus F. T., 4,701,421, Cl. 436-518.000.
Mattila, Heikki, to Sinisalo Sport OY. Protective garment. 4,700,407, Cl. 2-23.000.
Mattison, Robert N. Fishing lure. 4,700,504, Cl. 43-42.330.
Mattson, Glenn D., to Omaha Cold Storage Terminals. By-product chiller and method for using same. 4,700,546, Cl. 62-64.000.
Maucher, Paul; and Honemann, Rudolf, to Luk Lamellen und Kupplungsbau GmbH. Clutch plate. 4,700,821, Cl. 192-106.200.
Maucher, Paul; and Honemann, Rudolf, to LUK Lamellen und Kupplungsbau GmbH. Torsion damping assembly for clutch plates. 4,700,822, Cl. 192-106.200.
Mauntel, Richard W.: *See*—
Cosentino, Stephen J.; Rugg, James M.; and Mauntel, Richard W., 4,701,775, Cl. 357-23.120.
Mausner, Eberhard: *See*—
Gademann, Lothar; Mattes, Bernhard; Mausner, Eberhard; Suchowerskyj, Wadym; and Rittmannsberger, Norbert, 4,700,973, Cl. 280-735.000.
Max Planck Gesellschaft: *See*—
Lubbers, Dietrich W.; and Opitz, Norbert, 4,701,697, Cl. 324-96.000.
Mazda Motor Corporation: *See*—
Hirano, Seiji; and Sato, Youji, 4,700,913, Cl. 248-73.000.
Kuraoka, Koji; Umeda, Morio; Konishi, Takeshi; and Tuchiya, Takanori, 4,700,982, Cl. 296-107.000.
Muranaka, Kozo, 4,700,472, Cl. 29-822.000.
McCanny, John V.; McWhirter, John G.; and Wood, Kenneth W., to National Research Development Corporation. Digital data processor for multiplying data by a coefficient set. 4,701,876, Cl. 364-728.000.
McCartney, Michael S., to Combustion Engineering, Inc. Volume reduction of low-level radiation waste by incineration. 4,700,637, Cl. 110-237.000.
McCauley, Robert G. Water collecting and spring box and gauging system and holding tank. 4,700,734, Cl. 137-236.100.
McCavour, Thomas C.: *See*—
Minialoff, Joseph M.; Blendick, Leonard E.; and McCavour, Thomas C., 4,700,511, Cl. 52-1.000.
McClean, John W., to Breville R & D Pty. Limited. Food processors. 4,700,901, Cl. 241-37.500.
McClure, Richard J., to Eastman Kodak Company. Slant gap thin-film head having first and second wedge-shaped structures. 4,701,820, Cl. 360-125.000.
McConchie, Garnet E.: *See*—
Swearingen, Loren L.; Embrey, Wallace E.; LaTulip, Randy J.; Earls, Jim D.; and McConchie, Garnet E., 4,701,529, Cl. 546-251.000.
McCormack, John F.: *See*—
DeLuca, Michael A.; and McCormack, John F., 4,701,352, Cl. 427-98.000.
McCullough, Harold E., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Core formed of hard and soft magnetic materials for an electrical relay apparatus. 4,701,721, Cl. 335-79.000.
McDougall, Ian L.; and Bird, John M., to Oxford Magnet Technology Limited. Magnet assembly having a plurality of nested coaxial coils. 4,701,736, Cl. 335-299.000.
McElroy, David J., to Texas Instruments Incorporated. Dynamic memory array with quasi-folded bit lines. 4,701,885, Cl. 365-189.000.
McElroy, Lucian G. Nozzle assembly for fluid stripping apparatus. 4,700,426, Cl. 15-316.00R.
McFarland, Ronald F.; and Apparcel, Richard A. Segmented tubular fishing gear container. 4,700,502, Cl. 43-21.200.
McFarlane, Reuben C. Heavy crude oil production tool and method. 4,700,781, Cl. 166-303.000.
McGhee, James B.; Egan, Joseph W.; and Hill, Leslie C., to Hill, Leslie C. Integrated, usage-dependent temperature control for gas water heaters. 4,700,886, Cl. 236-25.00R.
McGovern, Lorayne. Gurney extension. 4,700,417, Cl. 5-81.00R.
McGuinness, Mario F. Roofing shingle separating and laying machine. 4,700,526, Cl. 52-749.000.
McHugh, Thomas O.: *See*—
Pettinga, Robert; Dix, Joseph; McHugh, Thomas O.; Sibley, Lincoln L., Jr.; Ziemba, Richard T.; and Forrester, Victor J., 4,700,608, Cl. 89-11.000.
McIlroy, Paul W. A.; Kurobe, Atsushi; and Furuyama, Hideto, to Kabushiki Kaisha Toshiba. Light emitting semiconductor device. 4,701,774, Cl. 357-17.000.
McIntyre, James A.: *See*—
Kalnins, John M.; McIntyre, James A.; Moyer, John R.; Phillips, Robert F.; and Snoble, Karel A. J., 4,701,247, Cl. 204-131.000.
McKinnie, Bonnie G.; and Mitchell, Olan W., to Ethyl Corporation. Process for preparing tetrabromobisphenol-A. 4,701,568, Cl. 568-726.000.
McLaughlin, Kevin L.: *See*—
Wrathall, Robert S.; and McLaughlin, Kevin L., 4,701,883, Cl. 365-154.000.
McMurtry, Carl H.: *See*—
Boecker, Wolfgang D. G.; Hailey, Laurence N.; and McMurtry, Carl H., 4,701,427, Cl. 501-92.000.
McNally, Paul F.; Allen, Spencer W.; and Cimbala, Matthew G., to International Cybernetic Corporation. Sampled data servo control system with field orientation. 4,701,839, Cl. 364-167.000.
McQueeney, James F.: *See*—
Kasevich, Raymond S.; McQueeney, James F.; and Crooker, Ronald H., 4,700,716, Cl. 128-804.000.
McWhirter, John G.: *See*—
McCanny, John V.; McWhirter, John G.; and Wood, Kenneth W., 4,701,876, Cl. 364-728.000.
Mead, Albert R., to Grumman Aerospace Corporation. Molding process and apparatus utilizing memory metal alloy springs. 4,701,293, Cl. 264-258.000.
Mead Corporation, The: *See*—
Rourke, John K.; and O'Connor, Joseph G., 4,701,397, Cl. 430-138.000.
Meanwell, Nicholas A.; and Wright, John J., to Bristol-Myers Company. 7-amino-1,3-dihydro-2H-imidazo[4,5-b]quinolin 2-ones and method for inhibiting phosphodiesterase and blood platelet aggregation. 4,701,459, Cl. 514-293.000.
Measurex Corporation: *See*—
De Mol, Dirk; and Shaw, Graham, 4,700,557, Cl. 72-12.000.
Meatto, Franklin D.; and Pilpel, Edward D., to TriStar Sports Inc. Asymmetric alpine ski with offset boot platform. 4,700,967, Cl. 280-609.000.
Mechanical Technology Incorporated: *See*—
Hoogenboom, Leo, 4,701,610, Cl. 250-227.000.
Kissinger, Curtis D., 4,701,611, Cl. 250-227.000.
Medgvesy, Stephen, to Sulzer Brothers Limited. Turbomachine housing. 4,701,103, Cl. 415-219.00C.
Medical Innovations Corporation: *See*—
Parks, Stephen K., 4,701,163, Cl. 604-178.000.

Meier, Bert: *See*—
Jellinek, Karl; Meier, Bert; and Grundke, Ulrich, 4,701,478, Cl. 522-97.000.

Meilach, Alan: *See*—
Beech, Brian; Rust, Jeff; Meilach, Alan; and LeVasseur, Rod, 4,701,600, Cl. 235-375.000.

Meissner, David C.: *See*—
Kaneko, Dentaro; and Meissner, David C., 4,701,214, Cl. 75-38.000.

Meissner, Horst, to Gewerkschaft Eisenhutte Westfalia. Pivot connections for use with mine roof supports. 4,701,079, Cl. 405-296.000.

Meissner, Ralph: *See*—
Freisen, Ludger; Kess, Helmut; Krause, Norbert; and Meissner, Ralph, 4,701,710, Cl. 324-318.000.

Meistrell, William R., to Dive N'Surf, Inc. Adjustably wrappable, stretchable strap for shin guard. 4,700,406, Cl. 2-22.000.

Menchetti, Robert J.; and Chapman, Robert M., to National Gypsum Company. Wall panel leveling support clip. 4,700,515, Cl. 52-126.100.

Mendelson, Leah T.: *See*—
Croudace, Michael C.; Mendelson, Leah T.; and Holstedt, Richard A., 4,701,274, Cl. 252-46.300.

Mendy, Francois; and Barthelemy, Pierre, to Roussel-Uclaf. Oxidized triglycerides having therapeutic utility. 4,701,468, Cl. 514-547.000.

Mendy, Francois; and Barthelemy, Pierre, to Roussel Uclaf. Triglycerides, process for therapeutical applications and compositions containing them. 4,701,469, Cl. 514-547.000.

Menke, W. Kenneth: *See*—
Pearlman, Barry; and Menke, W. Kenneth, 4,701,743, Cl. 340-84.000.

Menniti, Pietro: *See*—
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Broihanne, Georges; and Magnier, Pierre, 4,700,768, Cl. 164-361.000.

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Luchinger, Paul, 4,700,793, Cl. 177-181.000.

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Kurachi, Hisao; Minaminaka, Kazuyoshi; Ito, Takeo; and Yamakawa, Kiyoshi, 4,701,579, Cl. 200-5.00A.

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Minato, Osamu: *See*—
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Van Erden, Donald L., 4,701,361, Cl. 428-36.000.
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Bernard, Emile C., 4,700,528, Cl. 53-398.000.
Lindsay, Erin J.; and Pittman, John N., 4,701,160, Cl. 604-53.000.
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Masumoto, Hisayuki, 4,701,033, Cl. 350-425.000.
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Locke, David R.; and Miska, Aivars, 4,700,476, Cl. 30-43.910.
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Morimoto, Teruyo; Sano, Yumiko; Nimura, Eiji; Tomii, Yuji; and Maeda, Tatsuo, 4,701,389, Cl. 430-110.000.
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Mitchell, Olan W.: *See*—
McKinnie, Bonnie G.; and Mitchell, Olan W., 4,701,568, Cl. 568-726.000.
Mitchell, William D., to Chalco Engineering Corporation. Locking device for reciprocating members. 4,700,814, Cl. 188-67.000.
Mitsam, Reinwald, to Messrs. Leonhard Kurz. Method for applying an embossing foil to a flexible material. 4,701,235, Cl. 156-233.000.
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Fujiwara, Naohisa, 4,701,787, Cl. 358-36.000.
Matsukawa, Takayuki, 4,700,457, Cl. 437-52.000.
Sato, Kazuhiko; Nakamura, Genshiro; and Itagaki, Takushi, 4,701,572, Cl. 136-258.000.
Seiwa, Yoshito; and Takamiya, Saburo, 4,701,926, Cl. 372-45.000.
Senba, Takashi; and Tachikawa, Satoru, 4,700,572, Cl. 73-622.000.
Tanaka, Hideharu; Sekiya, Mutsuo; and Uchikawa, Fusaoki, 4,700,805, Cl. 181-265.000.
Tanaka, Kunimaro; and Ozaki, Minoru, 4,701,812, Cl. 360-32.000.
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Chikamori, Sunao; and Iwata, Hideyuki, 4,700,933, Cl. 267-140.100.
Mitsubishi Mining & Cement Co., Ltd.: *See*—
Yamauchi, Kouji; and Ueda, Chikai, 4,701,091, Cl. 414-70.000.
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Fujii, Tadashi; Yagami, Hiroyuki; Seo, Iwao; and Sasaki, Masahiro, 4,701,659, Cl. 310-334.000.
Mitsubishi Petrochemical Company Limited: *See*—
Fujii, Masaki; Sakai, Takao; Sakurai, Hideo; and Yamamoto, Yosiharu, 4,701,505, Cl. 526-125.000.
Mitsui Sekiyu Kagaku Kogyo Kabushiki Kaisha: *See*—
Homma, Shirou; Izumi, Takashi; and Murakami, Sakae, 4,701,508, Cl. 526-249.000.
Mitsui Toatsu Chemical, Incorporated: *See*—
Itoh, Hiroshi; Nitta, Atsuhiko; and Kamio, Hideo, 4,701,283, Cl. 260-507.00R.
Mitsui Toatsu Chemicals, Inc.: *See*—
Tanabe, Yoshimitsu; Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,701,567, Cl. 568-719.000.
Mitsukuchi, Kunio; Ito, Hiromitsu; Eguchi, Isamu; Hirasato, Bunji; and Furuhata, Takashi, to Takamatsu Electric Works, Ltd. Gas switch. 4,701,583, Cl. 200-148.00B.
Mitsumoto, Takashi; Eiermann, Dankwart; and Nuber, Roland, to Aisin Seiki Kabushiki Kaisha; and Wankel GmbH, Firma. Discharge valve. 4,700,740, Cl. 137-512.150.
Mitutoyo Mfg. Co., Ltd.: *See*—
Fukuyoshi, Minoru; Furuto, Takashi; and Nakamura, Tetsuo, 4,701,704, Cl. 324-207.000.
Miura, Teiichi, to Alps Electric Co., Ltd. Mechanism for preventing simultaneous locking of multi-column switches. 4,700,586, Cl. 74-483.0PB.
Miura, Teiichi, to Alps Electric Co., Ltd. Simultaneous inter-row locking inhibiting mechanism for a multi-row interlocking switch device. 4,701,580, Cl. 200-5.00E.
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Miyake, Izumi; Kaneko, Kiyotaka; and Oda, Kazuya, to Fuji Photo Film Co., Ltd. Method of protecting a magnetic recording medium in a magnetic recording/playback system and apparatus therefor. 4,701,813, Cl. 360-71.000.
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Miyoshi, Takahito; Kasuga, Akira; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Tape for cleaning magnetic head. 4,701,364, Cl. 428-141.000.
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Hasegawa, Masazumi; Arai, Shoji; and Mizoe, Shinya, 4,701,473, Cl. 521-118.000.
Mizusaki, Shigenobu; Yoshida, Daisuke; and Saito, Yutaka, to Japan Tobacco Inc. Antitumor agent. 4,701,570, Cl. 568-821.000.
Mizusawa, Akira, to Nifco Inc. Ball joint. 4,701,064, Cl. 403-71.000.
Mjoberg, Jan-Olov, to Mora Hydraulics Aktiebolag. Recovery vehicle device. 4,700,852, Cl. 212-189.000.
Mobay Corporation: *See*—
Markusch, Peter H.; Rosthauser, James W.; and Tirpak, Robin E., 4,701,480, Cl. 523-340.000.
Moberg, Hans: *See*—
Inge, Claes; Lagerstedt, Torgny; Borgstroem, Leonard; Carlsson, Claes-Goeran; Naebo, Sven-Olof; Moberg, Hans; and Franzen, Peter, 4,701,158, Cl. 494-74.000.
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Altman, Lawrence J.; and Milliken, James B., 4,700,562, Cl. 73-64.000.
Chang, Clarence D.; and Weisz, Paul B., 4,701,313, Cl. 423-277.000.
Duncan, Gary L., 4,701,369, Cl. 428-313.900.
Park, Hee C. P., 4,701,370, Cl. 428-314.400.
Yan, Tsoung Y., 4,701,212, Cl. 75-26.000.
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Mock, Elmar; and Hotz, Jean-Marie, to ETA S.A. Fabriques d'Ebauches. Fancy artefact band with annular decorative portion surrounding elongated core. 4,700,874, Cl. 224-178.000.
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DeRo·s, Robert, 4,701,137, Cl. 439-394.000.
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Bills, Joseph W.; and Moller, William D., 4,701,098, Cl. 414-502.000.
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Larson, Byron A.; and Molteni, John J., 4,700,559, Cl. 72-461.000.
Monnerat, Georgia A.: *See*—
Bogan, Gary W.; Lucas, Peter A.; and Monnerat, Georgia A., 4,701,481, Cl. 523-428.000.
Monolithic Memories, Inc.: *See*—
Chan, Albert; Fitzpatrick, Mark; Goddard, Don; Bosnyak, Robert J.; and Tsui, Cyrus, 4,701,695, Cl. 324-510.000.
Monroe, Carl M.: *See*—
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Osborn, Scott E.; Farrugia, Vincent J.; Plischke, LeMoyne W.; and Wu, Chester C., 4,701,518, Cl. 528-336.000.
Zampini, Anthony, 4,701,186, Cl. 55-158.000.
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Weaver, Max A.; Moore, William H.; and Lum, Kin K., 4,701,439, Cl. 503-227.000.
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Le Ludec, Joel; Machurat, Jean; Morawski, Jean-Claude; and Soula, Gerard, 4,701,492, Cl. 524-493.000.

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Amazawa, Kiyoshi; and Mori, Akira, 4,701,715, Cl. 328-165.000.

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Harashima, Tadashi; Morita, Hideo; and Mori, Eiji, 4,700,676, Cl. 123-339.000.

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Matsuoka, Hiroki; Morimura, Atsushi; and Kitamura, Yoshinori, 4,701,784, Cl. 358-213.170.

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Krieger, Zvi; and Moritz, Alex, 4,700,543, Cl. 60-655.000.

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Thompson, Richard F.; Disney, Daniel J.; Quek, Swee-meng; and Westerfeld, Eric C., 4,701,844, Cl. 364-200.900.

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Birrittella, Mark S.; and Stipanuk, James J., 4,701,882, Cl. 365-154.000.
Cosentino, Stephen J.; Rugg, James M.; and Mauntel, Richard W., 4,701,775, Cl. 357-23.120.
Davis, Walter L.; and Parikh, Dakshesh D., 4,701,943, Cl. 379-57.000.
Dunkerton, Stephen H.; Erickson, Gary D.; and Reynolds, Gary R., 4,701,758, Cl. 340-825.480.
Freyman, Bruce J.; Dorinski, Dale; and Shurboff, John, 4,700,473, Cl. 29-846.000.
Howard, Scott P.; Kozlowski, Ted A.; and Retzer, Michael H., 4,701,944, Cl. 379-63.000.
Jasper, Steven C., 4,701,934, Cl. 375-1.000.
Martin, William J., 4,701,724, Cl. 333-103.000.
Nadir, Mark; and Hauck, John D., 4,701,759, Cl. 340-825.440.
Richard, Fred V.; Hickernell, Fred S.; and Cho, Frederick Y., 4,701,008, Cl. 350-96.120.
Wrathall, Robert S.; and Sutor, Judy L., 4,701,718, Cl. 330-253.000.
Wrathall, Robert S.; and McLaughlin, Kevin L., 4,701,883, Cl. 365-154.000.

Mottate, Tatsuo, to Nippon Thompson Co., Ltd. Stopper mechanism of a linear motion rolling contact bearing assembly. 4,701,058, Cl. 384-45.000.

Mouissie, Bob, to Du Pont de Nemours, E. I., and Company. Edge connector with clamping contact elements. 4,701,002, Cl. 439-426.000.

Moura, Anne-Marie: *See—*
Torelli, Vesperto; Nedelec, Lucien; Moguilewski, Martine; and Moura, Anne-Marie, 4,701,449, Cl. 514-175.000.

Mourey, Bruno: *See—*
Le Pesant, Jean-Pierre; Hareng, Michel; Mourey, Bruno; and Perbet, Jean-Noel, 4,701,021, Cl. 350-267.000.

Moyer, John R.: *See—*
Kalnins, John M.; McIntyre, James A.; Moyer, John R.; Phillips, Robert F.; and Snoble, Karel A. J., 4,701,247, Cl. 204-131.000.

Muhle, Michael E.: *See—*
Agapiou, Agapios K.; Muhle, Michael E.; and Kurtzman, Myron B., 4,701,506, Cl. 526-128.000.

Mullane, John F.: *See—*
Ryder, Steven W.; Shand, David G.; and Mullane, John F., 4,701,467, Cl. 514-524.000.

Muller, Clifford H., III: *See—*
West, William P.; and Muller, Clifford H., III, 4,701,616, Cl. 250-251.000.

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Artzt, Peter; Muller, Heinz; Ziegler, Kurt; Egbers, Gerhard; and Wokaun, Jacek, 4,700,431, Cl. 19-105.000.

Muller, Johannes C. A., to U.S. Philips Corporation. Helical scan tape recorder without head-tape contact in stand-by mode. 4,701,821, Cl. 360-130.240.

Muller, Karl-Heinz, to Rotzler GmbH & Co. Apparatus for recovering and towing a vehicle. 4,701,099, Cl. 414-563.000.

Muller, Lon J.; Franklin, Austin; and George, Robert W., II, to Denning Mobile Robotics, Inc. Ultrasonic ranging system. 4,701,893, Cl. 367-87.000.

Muller, Rolf: *See—*
Merkle, Alfred; Moosmann, Georg; and Muller, Rolf, 4,701,653, Cl. 310-152.000.

Muller, Rudolph R. M., to Multifastener Corporation. Fastener installation apparatus. 4,700,470, Cl. 29-798.000.

Muller, Wolfgang: *See—*
Schuetz, Alfred; Muller, Wolfgang; and Soutschek, Ewald, 4,701,634, Cl. 307-269.000.

Mullins, Michael J., to Dow Chemical Company, The. Alkenylamino carbonyl carbamates. 4,701,549, Cl. 560-159.000.

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Muller, Rudolph R. M., 4,700,470, Cl. 29-798.000.

MultiTek Corporation: *See—*
Choinski, Edward J., 4,700,474, Cl. 29-846.000.

Munch, Walter. Cold and warm pack for physiotherapy and the like. 4,700,706, Cl. 128-403.000.

Mundell, Robert D.; and Bennett, C. Richard. Cervical appliance to ameliorate sleep apneas. 4,700,697, Cl. 128-75.000.

Murakami, Sakae: *See—*
Homma, Shirou; Izumi, Takashi; and Murakami, Sakae, 4,701,508, Cl. 526-249.000.

Murakami, Yoshikazu: *See—*
Ito, Seigo; and Murakami, Yoshikazu, 4,701,729, Cl. 333-219.000.

Muralidhara, Ranya: *See—*
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Miller, Kevin P.; and Wiener, Charles, 4,701,548, Cl. 560-152.000.

Muranaka, Akio: *See—*
Kawasaki, Kazuhiro; and Muranaka, Akio, 4,700,411, Cl. 2-425.000.

Muranaka, Kozo, to Mazda Motor Corporation. Working apparatus provided along a workpiece conveyor. 4,700,472, Cl. 29-822.000.

Muranishi, Hideo: *See—*
Ashizaki, Shigeya; Sugahara, Koichi; Muranishi, Hideo; and Natsuhara, Masao, 4,701,677, Cl. 315-382.000.

Murata Manufacturing Co., Ltd.: *See—*
Sakamoto, Yukio; Madokoro, Shinichi; and Okuyama, Shingo, 4,700,440, Cl. 29-25.420.

Murphy, Edward P., to Graco Inc. Ball check valve. 4,700,741, Cl. 137-543.190.

Murphy, Marilyn S.: *See—*
Bernhagen, James R.; Crabb, Elmer R.; Murphy, Marilyn S.; Roley, Daniel G.; St. Germain, Gene R.; and Tunnell, James H., 4,700,794, Cl. 180-6.440.

Murphy, William P. Die transfer system. 4,700,624, Cl. 100-224.000.

Murray Electronics Associates Limited Partnership: *See—*
Hoffman, Kent C., 4,700,710, Cl. 128-641.000.

Mutsers, Stanislaus M. P.; and Craenen, Gerardus S. P. M., to Unie van Kunstmestfabrieken B.V. Process for the preparation of granules. 4,701,353, Cl. 427-213.000.

MWB Messwandler-Bau AG: *See—*
Oppelt, Herbert; and Lechner, Rufolf, 4,700,905, Cl. 242-67.10R.
Preissinger, Norbert; and Bogdan, Teofil, 4,701,738, Cl. 336-92.000.

Mzik, Joseph: *See—*
Bullen, Ronald S.; Mzik, Joseph; and Richard, Jean P., 4,701,270, Cl. 252-8.551.

Nabisco Brands, Inc.: *See*—
Softly, Billy J.; and Huang, An S., 4,701,336, Cl. 426-538.000.
Nadir, Mark; and Hauck, John D., to Motorola, Inc. Call reminder for a radio paging device. 4,701,759, Cl. 340-825.440.
Naebo, Sven-Olof: *See*—
Inge, Claes; Lagerstedt, Torgny; Borgstroem, Leonard; Carlsson, Claes-Goeran; Naebo, Sven-Olof; Moberg, Hans; and Franzen, Peter, 4,701,158, Cl. 494-74.000.
Naef, Ferdinand; and Vial, Christian, to Firmenich S.A. Process for the preparation of oxygenated decaline derivatives. 4,701,543, Cl. 549-458.000.
Nagahara, Shusaku: *See*—
Satou, Kazuhiro; Kudo, Koji; Maruyama, Masanori; Mimura, Itaru; and Nagahara, Shusaku, 4,701,679, Cl. 315-383.000.
Nagai, Asaki: *See*—
Akimoto, Taizo; and Nagai, Asaki, 4,701,800, Cl. 358-244.000.
Nagai, Masahide; Noda, Minoru; and Suzuki, Hitoshi, to Seiko Instruments & Electronics Ltd. Industrial robot. 4,701,100, Cl. 414-751.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Pedal for a bicycle. 4,700,588, Cl. 74-594.400.
Nagano, Teruo; Toyama, Tadao; and Nagashima, Akira, to Fuji Photo Film Co., Ltd. Photosensitive composition with 2-halomethyl-5-substituted-1,3,4-oxadiazole. 4,701,399, Cl. 430-179.000.
Nagashima, Akira: *See*—
Nagano, Teruo; Toyama, Tadao; and Nagashima, Akira, 4,701,399, Cl. 430-179.000.
Nagashima, Nao, to Canon Kabushiki Kaisha. Image processing apparatus with variable magnification and gray level processing. 4,701,808, Cl. 358-287.000.
Nagata, Minoru, to Kabushiki Kaisha Toshiba. Differential amplification circuit. 4,701,719, Cl. 330-258.000.
Naitoh, Mitsugu; and Suehiro, Yoshiyuki, to Fujitsu Limited. Semiconductor device incorporating memory test pattern generating circuit. 4,701,919, Cl. 371-21.000.
Naka, Hiroshi; Seko, Ichiro; Kobayashi, Shuji; and Haneda, Makoto, to Hitachi, Ltd. Light emitting chip and optical communication apparatus using the same. 4,701,927, Cl. 372-46.000.
Nakagawa, Akio; Ohashi, Hiromichi; Ogura, Tsuneo; and Shimbo, Masaru, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor device wherein silicon substrates are bonded together. 4,700,466, Cl. 437-247.000.
Nakagawa, Akira, to Kabushiki Kaisha Toshiba. Optical disk apparatus. 4,701,897, Cl. 369-32.000.
Nakagawa, Masatsugu; and Iwano, Tatsuya, to NEC Corporation. Data switching system. 4,701,755, Cl. 340-825.020.
Nakagome, Yoshinobu: *See*—
Aoki, Masakazu; Horiguchi, Masashi; Nakagome, Yoshinobu; Ikenaga, Shinichi; Shimohigashi, Katsuhiro; Masuhara, Toshiaki; Itoh, Kiyoo; Nakamura, Hideo; and Minato, Osamu, 4,701,884, Cl. 365-189.000.
Nakajima, Kazuo: *See*—
Kaneda, Takao; and Nakajima, Kazuo, 4,701,773, Cl. 357-13.000.
Nakajima, Takayuki; Aoki, Tetsuo; Kobayashi, Katsumi; and Akiyama, Noboru, to Takeda Riken Kogyo Kabushikikaisha. Logic analyzer. 4,701,918, Cl. 371-20.000.
Nakamura, Genshiro: *See*—
Sato, Kazuhiko; Nakamura, Genshiro; and Itagaki, Takushi, 4,701,572, Cl. 136-258.000.
Nakamura, Hideo: *See*—
Aoki, Masakazu; Horiguchi, Masashi; Nakagome, Yoshinobu; Ikenaga, Shinichi; Shimohigashi, Katsuhiro; Masuhara, Toshiaki; Itoh, Kiyoo; Nakamura, Hideo; and Minato, Osamu, 4,701,884, Cl. 365-189.000.
Nakamura, Hiroki: *See*—
Sagoi, Masayuki; Tanaka, Yoichiro; and Nakamura, Hiroki, 4,701,374, Cl. 428-336.000.
Nakamura, Kiyoshi: *See*—
Hirotsu, Tetsuji; Kiwaki, Hisakatsu; Nakamura, Kiyoshi; Narita, Hiroshi; Kasai, Syozi; Kimura, Akira; and Tsutsui, Yoshio, 4,701,682, Cl. 318-52.000.
Nakamura, Seizo: *See*—
Ohara, Isao; and Nakamura, Seizo, 4,700,769, Cl. 164-514.000.
Nakamura, Takuji: *See*—
Ikemoto, Yoshihiro; Kataoka, Jiro; Otsuki, Toshinori; and Nakamura, Takuji, 4,701,810, Cl. 358-296.000.
Nakamura, Takumi: *See*—
Akihama, Shigeyuki; Saito, Makoto; Kawamoto, Akio; Banno, Tadashi; Umeki, Yoshihiko; and Nakamura, Takumi, 4,700,518, Cl. 52-309.160.
Nakamura, Tetsuo: *See*—
Fukuyoshi, Minoru; Furuto, Takashi; and Nakamura, Tetsuo, 4,701,704, Cl. 324-207.000.
Nakanishi, Nobuyasu: *See*—
Nishimura, Takumi; Saito, Tadao; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,700,991, Cl. 303-113.000.
Nakano, Sadao; and Inaba, Shigeru, to Niles Parts Co., Ltd. Hinge type relay. 4,701,734, Cl. 335-128.000.
Nakashima, Koichi: *See*—
Hasegawa, Kenji; Nakashima, Koichi; Eguchi, Tohru; and Ota, Masako, 4,701,320, Cl. 424-54.000.
Nakashima, Naoto: *See*—
Oshida, Yoshitada; Shiba, Masataka; Nakashima, Naoto; Nakata, Toshihiko; and Uto, Sachio, 4,701,050, Cl. 356-152.000.
Nakashima, Shinji: *See*—
Okada, Daisuke; Uchida, Akihisa; Takakura, Toshihiko; Nakashima, Shinji; Ohno, Nobuhiko; and Ogiue, Katsumi, 4,700,464, Cl. 437-67.000.
Nakata, Toshihiko: *See*—
Oshida, Yoshitada; Shiba, Masataka; Nakashima, Naoto; Nakata, Toshihiko; and Uto, Sachio, 4,701,050, Cl. 356-152.000.
Nakayama, Masayuki: *See*—
Yada, Hiroaki; Imakoshi, Shigeyoshi; Suyama, Hideo; Sekiya, Tetsuo; and Nakayama, Masayuki, 4,701,815, Cl. 360-77.000.
Namba, Yoshiharu; Suzuki, Hiroshi; and Sugita, Kazuhiko, to Toyoda Koki Kabushiki; and Namba, Yoshiharu. Spindle stock unit for surface grinding machine. 4,700,510, Cl. 51-134.50R.
Namiki, Junji, to NEC Corporation. One frequency repeater for a digital microwave radio system with cancellation of transmitter-to-receiver interference. 4,701,935, Cl. 375-4.000.
Napadow, Stanley C., to Protectaire Systems Co. Spray booth. 4,700,615, Cl. 98-115.200.
Narishige Corporation, Ltd.: *See*—
Narishige, Eiichi; and Yoneyama, Shinji, 4,700,584, Cl. 74-479.000.
Narishige, Eiichi; and Yoneyama, Shinji, to Narishige Corporation, Ltd. Manipulator usable for a glass electrode or the like. 4,700,584, Cl. 74-479.000.
Narita, Hiroshi: *See*—
Hirotsu, Tetsuji; Kiwaki, Hisakatsu; Nakamura, Kiyoshi; Narita, Hiroshi; Kasai, Syozi; Kimura, Akira; and Tsutsui, Yoshio, 4,701,682, Cl. 318-52.000.
Narula, Dipak; Be, Anh; and Zemanek, Charles P., to Dow Corning Corporation. Curable silicone composition for corrosion protection. 4,701,380, Cl. 428-447.000.
Nash, John: *See*—
Kensey, Kenneth; and Nash, John, 4,700,705, Cl. 128-341.000.
National Concrete Masonry Association: *See*—
Pardo, Jorge, 4,700,527, Cl. 52-763.000.
National Gypsum Company: *See*—
Menchetti, Robert J.; and Chapman, Robert M., 4,700,515, Cl. 52-126.100.
National Research Development Corporation: *See*—
Clark, Adrian P.; and Hau, Sau F., 4,701,936, Cl. 375-14.000.
McCanny, John V.; McWhirter, John G.; and Wood, Kenneth W., 4,701,876, Cl. 364-728.000.
Willard, Reginald A.; and Percival, William S., 4,701,711, Cl. 324-322.000.
National Semiconductor Corporation: *See*—
Millhollan, Michael S.; and Sung, Chiakang, 4,701,636, Cl. 307-297.000.
Monticelli, Dennis M., 4,701,720, Cl. 330-260.000.
Pease, Robert A., 4,701,779, Cl. 357-48.000.
Sankhagowit, Thanomsak, 4,701,781, Cl. 357-70.000.
Stanojevic, Silvo, 4,701,639, Cl. 307-350.000.
National Standard Company: *See*—
Rausch, Doyle W., 4,701,154, Cl. 474-205.000.
Natsuhara, Masao: *See*—
Ashizaki, Shigeya; Sugahara, Koichi; Muranishi, Hideo; and Natsuhara, Masao, 4,701,677, Cl. 315-382.000.
Naven, Finbar; and Hale, Stuart G., to International Computers Limited. Digital integrated circuit with multi-mode register. 4,701,916, Cl. 371-15.000.
Naylor, Harry B., to Pasco Laboratories, Inc. Method and apparatus for preventing cross-examination of biochemical test wells in a microtiter test plate. 4,701,412, Cl. 435-30.000.
Naylor, Nelson A. Front gauge for machine tool. 4,700,937, Cl. 269-304.000.
NCR Corporation: *See*—
Cohen, Morris, 4,701,843, Cl. 364-200.000.
Cone, Richard E.; and Paugstat, John F., 4,700,656, Cl. 177-245.000.
Isherwood, Jonathan M.; and Gibbs, Andrew R., 4,701,747, Cl. 340-365.00P.
Sato, Susumu; and Arashida, Toshio, 4,700,497, Cl. 40-531.000.
Szluk, Nicholas J., 4,701,423, Cl. 437-57.000.
Near Equilibrium Research Associates: *See*—
Oliker, Michael D., 4,701,189, Cl. 55-34.000.
Nearly Me: *See*—
Loi, Chay H., 4,701,230, Cl. 156-145.000.
NEC Corporation: *See*—
Akai, Takashi; Okamoto, Katsuro; and Usui, Shiro, 4,701,874, Cl. 364-724.000.
Ando, Manabu, 4,701,889, Cl. 365-230.000.
Asai, Ko; and Morita, Koichiro, 4,701,959, Cl. 382-1.000.
Nakagawa, Masatsugu; and Iwano, Tatsuya, 4,701,755, Cl. 340-825.020.
Namiki, Junji, 4,701,935, Cl. 375-4.000.
Taguchi, Tetsu, 4,701,955, Cl. 381-51.000.
Takashima, Yosuke, 4,701,806, Cl. 358-283.000.
NEC Home Electronics Ltd.: *See*—
Kumasaka, Toru; Ohya, Toshikazu; and Kamiji, Koichi, 4,701,628, Cl. 307-9.000.
Nedelec, Lucien: *See*—
Torelli, Vesperto; Nedelec, Lucien; Moguilewski, Martine; and Moura, Anne-Marie, 4,701,449, Cl. 514-175.000.
Needling, Michael C.: *See*—
Giatras, James L.; Mang, Warren G.; Marino, Charles P.; Needling, Michael C.; and Pezdirtz, George F., 4,701,345, Cl. 427-45.100.
Neefe, Charles W., to Bausch & Lomb Incorporated. Cosmetic contact lens. 4,701,038, Cl. 351-162.000.

Neff, Mary S.: *See*—
Bass, Vance R.; Bonebrake, Veronica A.; Garrison, David A.; Landis, James K.; Neff, Mary S.; Urquhart, Robert J.; and Williams, Susan C., 4,701,851, Cl. 364-419.000.
Nellcor Incorporated: *See*—
New, William, Jr.; and Corenman, James E., 4,700,708, Cl. 128-633.000.
Nelsen, Charles E.; and Mannion, Catharine, to Plant Genetics, Inc. Membrane-coated hydrogel encapsulated nematodes. 4,701,326, Cl. 424-408.000.
Nelson, Catherine E.; Crowley, Dennis E.; and Weatherford, Wayne M., to Borden, Inc. Calcium-fortified milk. 4,701,329, Cl. 426-74.000.
Nelson, Charles R.; and Thomas, Hugh, to Imperial Chemical Industries PLC. Fabric conditioners. 4,701,268, Cl. 252-8.800.
Nelson, Deanna; and Rowe, Bruce, to Baxter Travenol Laboratories, Inc. Nutrient polyesters. 4,701,443, Cl. 514-23.000.
Nelson, Gary J.: *See*—
Wiethoff, Roger H.; and Nelson, Gary J., 4,700,609, Cl. 89-46.000.
Nelson, John E.; and Smith, Raymond J., to Vetco Gray, Inc. Pressure energized rotary hydraulic seal. 4,700,924, Cl. 251-58.000.
Nelson, Paul G., to Northern Telecom Limited. Circuit and method for extracting signalling information embedded in channelized serial data streams. 4,701,913, Cl. 370-110.100.
Nelson, Richard V.; and Stephen, John F., to ICI Americas Inc. Malonate-based light stabilizers for plastics. 4,701,485, Cl. 524-98.000.
Nelson, Terry N., to Specialty Mfg. Co., The. Combination wall mount, caddy mount garden hose reel. 4,700,737, Cl. 137-355.270.
Neptune Corporation: *See*—
Swenson, Paula S., 4,701,146, Cl. 446-130.000.
Nestec S.A.: *See*—
Leuba, Jean-Louis; Meyer, Inge; and Andersen, Else M., 4,701,339, Cl. 426-643.000.
Margolis, Geoffrey; Mercier, Alain; and Schlecht, Klaus, 4,701,333, Cl. 426-432.000.
Nestlerode, C. Dale, to Hughes Aircraft Company. Fast tuning RF network inductor. 4,701,732, Cl. 334-56.000.
Neth, Harald. Control circuit. 4,701,958, Cl. 381-68.000.
Nettel, Hans, to Tom-Kap-Co. Quick release cover. 4,701,089, Cl. 411-373.000.
Netzer, Gabriel: *See*—
Groesch, Lothar; Netzer, Gabriel; and Kassing, Lothar, 4,701,132, Cl. 434-274.000.
Nevers, Ashley D. Odor-fading prevention from organosulfur-odorized liquefied petroleum gas. 4,701,303, Cl. 422-41.000.
Neville, Glen F., to Glenco Manufacturing, Inc. Method of coating the threads of a fastener. 4,701,348, Cl. 427-57.000.
New, William, Jr.; and Corenman, James E., to Nellcor Incorporated. Calibrated optical oximeter probe. 4,700,708, Cl. 128-633.000.
New York Institute of Technology: *See*—
Glenn, William E., 4,701,783, Cl. 358-12.000.
Neward, Theodore C. Container cap for liquid transfer. 4,700,861, Cl. 215-309.000.
Newman, Gerard R.: *See*—
Szirmai, Stephen G.; Newman, Gerard R.; and Kelly, Philip L., 4,701,941, Cl. 378-122.000.
Ng, Yee S.: *See*—
Alexandrovich, Peter S.; Santilli, Domenic; and Ng, Yee S., 4,701,387, Cl. 430-45.000.
NGK Insulators, Ltd.: *See*—
Sasaki, Shingo, 4,701,106, Cl. 416-241.00B.
NGK Spark Plug Co., Ltd.: *See*—
Okuno, Akiyasu; and Watanabe, Masakazu, 4,701,426, Cl. 501-90.000.
Nichol, Charles A.; Reinhard, John F., Jr.; Smith, Gary K.; and Bigham, Eric C., to Burroughs Wellcome Co. Biopterin analogs. 4,701,455, Cl. 514-249.000.
Nichols, John L., to Logical Services, Inc. Adaptive instruction sequence synthesizer and process. 4,701,847, Cl. 364-200.000.
Nickel, Hans: *See*—
Schierling, Roland; Geyer, Werner; Wissmann, Michael; and Nickel, Hans, 4,700,668, Cl. 123-73.00C.
Nickoladze, Leo G. Synchronous generators. 4,701,691, Cl. 322-32.000.
Nieboer, Keith A.; and Tucker, Herbert D., to Donnelly Corporation. Molded panel assembly and fasteners therefor. 4,700,525, Cl. 52-698.000.
Nifco Inc.: *See*—
Arakawa, Masaru; and Numata, Masanori, 4,701,229, Cl. 156-69.000.
Hirano, Seiji; and Sato, Youji, 4,700,913, Cl. 248-73.000.
Mizusawa, Akira, 4,701,064, Cl. 403-71.000.
Nigg, Berno: *See*—
Deutschenbaur, Paul; Rupprecht, Hans; Burtscher, Norbert; and Nigg, Berno, 4,701,083, Cl. 408-240.000.
Niino, Yasuo: *See*—
Tsujiuchi, Toshio; and Niino, Yasuo, 4,700,483, Cl. 33-125.00R.
Niinomi, Masahiro: *See*—
Kuwahara, Hideyuki; Kondo, Bunji; Takada, Jun; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,701,301, Cl. 419-21.000.
Niinuma, Susumu: *See*—
Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, 4,701,902, Cl. 369-77.100.
Nikaido, Masaya: *See*—
Uchino, Kazuyoshi; and Nikaido, Masaya, 4,700,733, Cl. 137-117.000.
Niles Parts Co., Ltd.: *See*—
Nakano, Sadao; and Inaba, Shigeru, 4,701,734, Cl. 335-128.000.
Nilsson, Claes T.: *See*—
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,701,121, Cl. 425-526.000.
Nilsson, Tatiana. Instrument for cutting tissues in surgery. 4,700,702, Cl. 128-305.000.
Nimlok Company: *See*—
Perutz, Simon G. A.; and Perutz, Gerald E. A., 4,700,498, Cl. 40-603.000.
Nimura, Eiji: *See*—
Morimoto, Teruyo; Sano, Yumiko; Nimura, Eiji; Tomii, Yuji; and Maeda, Tatsuo, 4,701,389, Cl. 430-110.000.
Ninomiya, Hiroshi: *See*—
Henmi, Yoshiyasu; Terada, Takashi; Suzuki, Masaru; and Ninomiya, Hiroshi, 4,701,327, Cl. 424-455.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Katoh, Mitsumi, 4,701,956, Cl. 381-61.000.
Nippon Kayaku Kabushiki Kaisha: *See*—
Henmi, Yoshiyasu; Terada, Takashi; Suzuki, Masaru; and Ninomiya, Hiroshi, 4,701,327, Cl. 424-455.000.
Nippon Kogaku K.K.: *See*—
Tanimoto, Akikazu; and Ishizaka, Shoji, 4,701,606, Cl. 250-201.000.
Toyoda, Kenji; and Hishinuma, Toru, 4,701,804, Cl. 358-280.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Kondo, Kiyoshi; Kataoka, Fukuhiko; and Uno, Kiyotaka, 4,700,817, Cl. 188-380.000.
Nippon Seiki Co., Ltd.: *See*—
Hasegawa, Kyohei, 4,700,890, Cl. 239-103.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Tanaka, Katsuhiko, 4,701,651, Cl. 310-90.000.
Nippon Thompson Co., Ltd.: *See*—
Kashiwabara, Yoshihiro, 4,701,057, Cl. 384-45.000.
Mottate, Tatsuo, 4,701,058, Cl. 384-45.000.
Yokota, Yasunori, 4,701,059, Cl. 384-49.000.
Nippondenso Co., Ltd.: *See*—
Takeuchi, Hirotaka; Asai, Jiro; Yamada, Yasuhumi; and Yanase, Sumio, 4,701,692, Cl. 322-90.000.
Tatukawa, Juniti; and Kirihara, Shozo, 4,701,654, Cl. 310-153.000.
Watanabe, Takashi; Tsuda, Nobuo; and Tomikawa, Inao, 4,701,613, Cl. 250-227.000.
Nishi, Yoshiro: *See*—
Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, 4,701,902, Cl. 369-77.100.
Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Boat with apparatus for returning to upright condition. 4,700,650, Cl. 114-125.000.
Nishida, Masashi: *See*—
Yamaguchi, Yasumasa; and Nishida, Masashi, 4,701,558, Cl. 564-127.000.
Nishiguchi, Yasuo; Minami, Keijirou; and Hoda, Masakazu, to Kyocera Corporation. Thermal head and method for fabrication thereof. 4,701,769, Cl. 346-76.0PH.
Nishijima, Kazuo: *See*—
Imai, Motomasa; Harata, Mitsuo; Takahashi, Takashi; and Nishijima, Kazuo, 4,701,767, Cl. 346-74.200.
Nishikawa, Masao; Miyake, Junichi; Sakurai, Yoshimi; and Fukuda, Yukihiro, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling transmission capacity of a direct-coupling mechanism in hydraulic power transmission means of an automatic transmission for automotive vehicles in accordance with vehicle operation mode. 4,700,819, Cl. 192-3.620.
Nishikawa, Meisei: *See*—
Konishi, Kazuo; and Nishikawa, Meisei, 4,701,875, Cl. 364-728.000.
Nishimatsu, Masaharu; Takayama, Suguru; and Arioka, Hiroyuki, to TDK Corporation. Magnetic recording medium. 4,701,375, Cl. 428-336.000.
Nishimura, Kosuke: *See*—
Washizuka, Isamu; Nishimura, Kosuke; and Saiji, Mitsuhiro, 4,701,862, Cl. 364-513.500.
Nishimura, Takumi; Saito, Tadao; Nakanishi, Nobuyasu; and Noguchi, Noboru, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Valve assembly for brake fluid pressure control. 4,700,991, Cl. 303-113.000.
Nishimura, Toshio, to Sharp Kabushiki Kaisha. Solar battery circuit. 4,701,693, Cl. 323-303.000.
Nishimura, Yutaka: *See*—
Ota, Isamu; Nishimura, Yutaka; Nishio, Shigeru; and Yogo, Kenji, 4,700,682, Cl. 123-516.000.
Nishio, Shigeru: *See*—
Ota, Isamu; Nishimura, Yutaka; Nishio, Shigeru; and Yogo, Kenji, 4,700,682, Cl. 123-516.000.
Nishioka, Takeshi: *See*—
Koebisu, Mamoru; Nishioka, Takeshi; Kamijyukkoku, Nario; and Kawano, Hirosi, 4,701,472, Cl. 521-50.500.
Nishizuka, Hiroshi: *See*—
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,701,608, Cl. 250-205.000.

Nissan Motor Co., Ltd.: *See—*
Fujiki, Hiroyuki; Michiura, Yoshiharu; and Abe, Masafumi, 4,700,848, Cl. 211-63.000.
Harashima, Tadashi; Morita, Hideo; and Mori, Eiji, 4,700,676, Cl. 123-339.000.
Hayashi, Yoshimasa; Minezaki, Yutaka; Ito, Yoji; Inoue, Naoyuki; and Hirano, Yoshinori, 4,700,664, Cl. 123-41.270.
Matsuda, Toshiro, 4,701,854, Cl. 364-426.000.
Ura, Syouzabu; Kikuchi, Tsutomu; and Yasuda, Makoto, 4,700,666, Cl. 123-52.0MB.

Nissho Corporation: *See—*
Hattori, Hiroyuki; Uemura, Takashi; and Yamauchi, Toshio, 4,701,305, Cl. 422-73.000.

Nitta, Atsuhiko: *See—*
Itoh, Hiroshi; Nitta, Atsuhiko; and Kamio, Hideo, 4,701,283, Cl. 260-507.00R.

Nittan Company, Limited: *See—*
Kimura, Tetsuo, 4,701,625, Cl. 250-573.000.

Nitto Boseki Co., Limited: *See—*
Serizawa, Hajime; Ogihara, Keizo; Shimizu, Kiyoshi; and Harada, Susumu, 4,701,497, Cl. 525-292.000.

Nitto Chemical Industry Co., Ltd.: *See—*
Yamaguchi, Yasumasa; and Nishida, Masashi, 4,701,558, Cl. 564-127.000.

Niwa, Takashi: *See—*
Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; Bingo, Hideyuki; Kazusaka, Shoji; and Konishi, Keisuke, 4,701,582, Cl. 200-61.420.

NL Petroleum Products Limited: *See—*
Shirley, David, 4,700,790, Cl. 175-410.000.

Noah, George I.: *See—*
Reeve, Richard J.; and Noah, George I., 4,700,851, Cl. 212-181.000.

Nobel, Fred I.; and Ostrow, Barnet D., to LeaRonal, Inc. Bath and process for electroplating tin, lead and tin/alloys. 4,701,244, Cl. 204-44.400.

Noda, Minoru: *See—*
Nagai, Masahide; Noda, Minoru; and Suzuki, Hitoshi, 4,701,100, Cl. 414-751.000.

Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Light beam combining method and apparatus. 4,701,005, Cl. 350-3.700.

Noguchi, Noboru: *See—*
Nishimura, Takumi; Saito, Tadao; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,700,991, Cl. 303-113.000.

Noji, Akio: *See—*
Saito, Kaoru; Noji, Akio; Kakuta, Yonehiro; and Takigawa, Koichi, 4,700,479, Cl. 33-366.000.

Nojima, Masaki: *See—*
Koizumi, Yuichiro; Nojima, Masaki; and Shimiya, Keiji, 4,701,622, Cl. 250-486.100.

Nolte, Bernhard: *See—*
Wysk, Hans-Joachim; Stellmach, Dieter; Nolte, Bernhard; Gronwald, Gerd; and Maedge, Werner, 4,701,063, Cl. 400-621.000.

Nomura, Keizo: *See—*
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,701,608, Cl. 250-205.000.

Norberg, Helmer L., to Dendro Maskin DM AB. Method and device for placing edge protecting means at pressure-sensitive edges on objects. 4,700,530, Cl. 53-410.000.

NORDICA S.p.A.: *See—*
Pozzobon, Alessandro, 4,700,496, Cl. 36-117.000.

Nordlof, Richard D. Stock advancing apparatus with control arm damping. 4,700,907, Cl. 242-75.500.

Nortek Corporation: *See—*
Suprono, Paul W., 4,701,000, Cl. 439-423.000.

North American Philips Consumer Electronics Corp.: *See—*
Bradley, Ralph H., Jr., 4,701,020, Cl. 350-128.000.

North American Philips Corporation: *See—*
Cinalli, James A., 4,701,667, Cl. 313-594.000.
Fitzpatrick, Brian J., 4,701,019, Cl. 350-127.000.
Stupp, Edward H.; Fellows, Mark W.; and Steneck, Walter G., 4,701,671, Cl. 315-224.000.

North American Philips Lighting Corp.: *See—*
Lagree, James L.; and Elms, Robert T., 4,701,673, Cl. 315-244.000.

Northeast Filter Co., Inc.: *See—*
Holdsworth, Timothy M., 4,701,726, Cl. 333-185.000.

Northern Technologies Ltd.: *See—*
Hobbins, Martin E.; Dickie, Robert G.; and Pardo, Rene, 4,701,801, Cl. 353-245.000.

Northern Telecom Limited: *See—*
Hvezda, Jaroslav M.; Velsher, Benne; and Middlehurst, Richard J., 4,700,998, Cl. 439-325.000.
Kupferschmidt, Albert; Greene, Tracy D.; and Jaycox, Donald F., 4,700,995, Cl. 439-276.000.
Nelson, Paul G., 4,701,913, Cl. 370-110.100.
Richardson, Bruce A., 4,701,646, Cl. 307-570.000.
Volk, Thomas G.; and Jaycox, Donald F., 4,701,135, Cl. 439-54.000.

Notari, Bruno: *See—*
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,701,428, Cl. 502-8.000.

Nottoli, Robert G. Golf putting trainer. 4,700,949, Cl. 273-192.000.

Noufer, Glenn E.: *See—*
Laude, David P.; and Noufer, Glenn E., 4,701,643, Cl. 307-450.000.

Nouvet, Andre: *See—*
Rogemont, Jean; and Nouvet, Andre, 4,701,234, Cl. 156-230.000.

Nova Technologies, Inc.: *See—*
DiMatteo, Paul; and Chubb, Charles F., 4,700,415, Cl. 5-81.00R.

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Novolipetsky Politekhnichersky Institut Imeni Leninskogo Komsomola Belorusii: *See—*
Martyshenko, Jury P.; Martyshenko, Sergei J.; Kotelnikov, Jury S.; Kutukhtin, Evgeny G.; Ilyasova, Nelli I.; Volkov, Jury S.; Vardanian, Armenak M.; and Petrosian, Misha S., 4,701,075, Cl. 405-217.000.

Nuber, Roland: *See—*
Mitsumoto, Takashi; Eiermann, Dankwart; and Nuber, Roland, 4,700,740, Cl. 137-512.150.

Nuclear Metals, Inc.: *See—*
Pollock, Eugene N., 4,701,310, Cl. 423-16.000.

Nuding, Werner: *See—*
Kraemer, Johannes; Leclere, Klemens; Nuding, Werner; and Schilde, Heinz-Josef, 4,701,240, Cl. 156-555.000.

Numata, Masanori: *See—*
Arakawa, Masaru; and Numata, Masanori, 4,701,229, Cl. 156-69.000.

Nunberg, Jack H., to Cetus Corporation. Feline leukemia virus vaccine plasmids for fusion protein of the gp70 envelope protein of FELV. 4,701,416, Cl. 435-320.000.

Nyrup, Torsten, to Aktieselskabet Thomas Ths. Sabroe & Co. Slice-ice producing machine. 4,700,551, Cl. 62-346.000.

Obayashyi, Hidehito: *See—*
Soda, Yasunari; Mochiji, Kozo; Kimura, Takeshi; and Obayashyi, Hidehito, 4,701,940, Cl. 378-34.000.

Obenauf, Hans-Dietrich: *See—*
Bretthauer, Karlheinz; and Obenauf, Hans-Dietrich, 4,701,932, Cl. 373-104.000.

O'Brien, Lawrence B., to Triune Automated Painting Systems. Paint roller and hose caddy assembly. 4,700,830, Cl. 206-229.000.

O'Connor, Joseph G.: *See—*
Rourke, John K.; and O'Connor, Joseph G., 4,701,397, Cl. 430-138.000.

Oda, Kazuya: *See—*
Miyake, Izumi; Kaneko, Kiyotaka; and Oda, Kazuya, 4,701,813, Cl. 360-71.000.

Oda, Naonobu: *See—*
Akiyama, Takashi; Hotta, Yasunari; and Oda, Naonobu, 4,701,372, Cl. 428-323.000.

Ofrex Group Holdings PLC: *See—*
Yeomans, James T., 4,700,902, Cl. 241-100.000.

Ogawa, Junji, to Fujitsu Limited. Semiconductor memory device having a redundancy circuit. 4,701,887, Cl. 365-200.000.

Ogawa, Kyosuke: *See—*
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,701,392, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,701,393, Cl. 430-57.000.

Ogawa, Youichi: *See—*
Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, 4,701,902, Cl. 369-77.100.

Ogihara, Keizo: *See—*
Serizawa, Hajime; Ogihara, Keizo; Shimizu, Kiyoshi; and Harada, Susumu, 4,701,497, Cl. 525-292.000.

Ogino, Yoshitaka, to Canon Kabushiki Kaisha. Method and apparatus for processing an image. 4,701,807, Cl. 358-284.000.

Ogiue, Katsumi: *See—*
Okada, Daisuke; Uchida, Akihisa; Takakura, Toshihiko; Nakashima, Shinji; Ohno, Nobuhiko; and Ogiue, Katsumi, 4,700,464, Cl. 437-67.000.

Ogura, Tsuneo: *See—*
Nakagawa, Akio; Ohashi, Hiromichi; Ogura, Tsuneo; and Shimbo, Masaru, 4,700,466, Cl. 437-247.000.

Oguri, Yukio: *See—*
Sasaki, Mitsuru; and Oguri, Yukio, 4,701,209, Cl. 71-97.000.

Ohara Co., Ltd.: *See—*
Ohara, Isao; and Nakamura, Seizo, 4,700,769, Cl. 164-514.000.

Ohara, Isao; and Nakamura, Seizo, to Ohara Co., Ltd. Casting apparatus for titanium or titanium alloy. 4,700,769, Cl. 164-514.000.

Ohashi, Hiromichi: *See—*
Nakagawa, Akio; Ohashi, Hiromichi; Ogura, Tsuneo; and Shimbo, Masaru, 4,700,466, Cl. 437-247.000.

Ohmer, Herve; and Delpuech, Alain G. M., to Schlumberger Technology Corporation. Device for locking a set of gimbal-mounted detectors. 4,701,890, Cl. 367-25.000.

Ohna, Bernt E. Internal combustion engine. 4,700,667, Cl. 123-61.00R.

Ohno, Nobuhiko: *See—*
Okada, Daisuke; Uchida, Akihisa; Takakura, Toshihiko; Nakashima, Shinji; Ohno, Nobuhiko; and Ogiue, Katsumi, 4,700,464, Cl. 437-67.000.

Ohtani, Hirofumi: *See—*
Takiguchi, Hideki; Yamada, Yoshitaka; Ohtani, Hirofumi; and Kashiwagi, Hiroshi, 4,701,405, Cl. 430-567.000.

Ohya, Toshikazu: *See*—
Kumasaka, Toru; Ohya, Toshikazu; and Kamiji, Koichi, 4,701,628, Cl. 307-9.000.
Oinaga, Yuji: *See*—
Kitamura, Toshiaki; and Oinaga, Yuji, 4,701,915, Cl. 371-13.000.
Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette with guard panel. 4,701,822, Cl. 360-132.000.
Oita, Masahiro, to Matsushita Electric Industrial Co., Ltd. Dissolved gas and ion measuring electrode system. 4,701,252, Cl. 204-402.000.
Okada, Daisuke; Uchida, Akihisa; Takakura, Toshihiko; Nakashima, Shinji; Ohno, Nobuhiko; and Ogiue, Katsumi, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Method of forming trench isolation in an integrated circuit. 4,700,464, Cl. 437-67.000.
Okada, Kazuo, to Kabushiki Kaisha Universal. Slot machine with playing card symbols. 4,700,948, Cl. 273-143.00R.
Okamoto, Katsuro: *See*—
Akai, Takashi; Okamoto, Katsuro; and Usui, Shiro, 4,701,874, Cl. 364-724.000.
Okamoto, Kunihiko, to Hitachi Cable Ltd. Inductive radio antenna cable. 4,701,730, Cl. 333-237.000.
Okazaki, Hiroshi: *See*—
Omae, Kazuo; and Okazaki, Hiroshi, 4,701,802, Cl. 358-246.000.
Okazaki, Kiyoshi, to Kabushiki Kaisha Toshiba. Ultrasonic imaging apparatus. 4,700,571, Cl. 73-597.000.
Oki Electric Industry Co., Ltd.: *See*—
Fukasawa, Atsushi; Sato, Takuro; Akiyama, Haruhiko; and Kawabe, Manabu, 4,701,923, Cl. 371-41.000.
Kawazoe, Akio; and Inoue, Satoru, 4,701,635, Cl. 307-270.000.
Yokouchi, Hiroshi, 4,701,888, Cl. 365-203.000.
Okitsu, Kiyoshi, to Daicel Chemical Industries. Ltd. Lactone-modified hydroxyethyl (meth) acrylate solution. 4,701,483, Cl. 523-500.000.
Oku, Kentaro; Fukushima, Masakazu; Suzuki, Hitomi; and Maruyama, Masanori, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Cylindrical image pickup tube having electrostatic deflection electrodes formed of straight line pattern yokes. 4,701,668, Cl. 315-17.000.
Okumura, Masahide; Matsuzaka, Takashi; Matsuoka, Genya; and Saitou, Norio, to Hitachi, Ltd. Electron beam exposure apparatus. 4,701,620, Cl. 250-398.000.
Okumura, Takeshi: *See*—
Kanda, Mutsumi; Okumura, Takeshi; and Iwashita, Yoshihiro, 4,700,665, Cl. 123-41.82R.
Okuno, Akiyasu; and Watanabe, Masakazu, to NGK Spark Plug Co., Ltd. Silicon carbide-graphite composite material. 4,701,426, Cl. 501-90.000.
Okutsu, Hideo; Mikami, Koushirou; Yonezawa, Kazuyoshi; and Ichikawa, Kuniharu, to Matsushita Electric Works, Ltd. Portable hand-held electric hair dryer with a retractable hand grip. 4,701,595, Cl. 219-364.000.
Okuyama, Shingo: *See*—
Sakamoto, Yukio; Madokoro, Shinichi; and Okuyama, Shingo, 4,700,440, Cl. 29-25.420.
O'Leary, Kevin: *See*—
Fenn, Robert W., III; Pless, Emory J.; Harris, Richard L.; and O'Leary, Kevin, 4,701,250, Cl. 204-283.000.
Oliker, Michael D., to Near Equilibrium Research Associates. Rotary sorption bed system and method of use. 4,701,189, Cl. 55-34.000.
Olin Corporation: *See*—
Barber, Larry J., 4,701,363, Cl. 428-137.000.
Oliva, Raymond A.; and Metz, Joseph S. Device for controlling the application of power to a computer. 4,701,946, Cl. 379-98.000.
Oljynpuristamo Oy: *See*—
Rissanen, Vilppu U., 4,700,718, Cl. 130-27.00R.
Olldag, Peder E. S.: *See*—
Buchhave, Preben; Knuhtsen, John; and Olldag, Peder E. S., 4,701,051, Cl. 356-336.000.
Olnowich, Howard T., to International Business Machines Corporation. Method and apparatus for avoiding excessive delay in a pipelined processor during the execution of a microbranch instruction. 4,701,842, Cl. 364-200.000.
Olson, Kurt D., to Union Carbide Corporation. Process for the condensation of aldehydes. 4,701,562, Cl. 568-390.000.
Olympus Optical Co., Ltd.: *See*—
Ida, Masatoshi, 4,701,605, Cl. 250-201.000.
Mihara, Shin-ichi, 4,701,034, Cl. 350-427.000.
Mimura, Yoshiyuki; and Isono, Yasuo, 4,701,042, Cl. 355-3.0DD.
Shishido, Yoshio, 4,700,694, Cl. 128-6.000.
Takada, Katsuhiro, 4,701,032, Cl. 350-413.000.
Omae, Kazuo; and Okazaki, Hiroshi, to Sony Corporation. Cathode-ray tube with misalignment correcting tension band. 4,701,802, Cl. 358-246.000.
Omaha Cold Storage Terminals: *See*—
Mattson, Glenn D., 4,700,546, Cl. 62-64.000.
Omid, Ahmad; and Bassi, Pawan K., to Chevron Research Company. Chemical tobacco sucker control. 4,701,205, Cl. 71-78.000.
Omitsu, Takashi, to Aisin Seiki Kabushiki Kaisha. System for utilizing the negative torque of a power delivery system having a continuously variable ratio transmission for braking. 4,700,590, Cl. 74-857.000.
Omron Tateisi Electronics Co.: *See*—
Hayashi, Mitsuji; Niwa, Takashi; Hayakawa, Akihiko; Bingo, Hideyuki; Kazusaka, Shoji; and Konishi, Keisuke, 4,701,582, Cl. 200-61.420.
Omura, Takashi: *See*—
Kayane, Yutaka; Sawamoto, Hirokazu; Omura, Takashi; Harada, Naoki; and Takeshita, Akira, 4,701,524, Cl. 534-642.000.
Ono, Motoyuki: *See*—
Takaoka, Michio; Motai, Tsuneaki; Ono, Motovuki; Kaji, Isao; Hasegawa, Masakazu; Tan, Masayuki; and Kurata, Masaru, 4,701,117, Cl. 425-116.000.
Ontario, Inc.: *See*—
Roche, Richard G.; and Blades, Russell, 4,700,548, Cl. 62-139.000.
Ooishi, Shogo: *See*—
Takeuchi, Hitoshi; and Ooishi, Shogo, 4,700,896, Cl. 239-693.000.
Oomea, Gysbert L.: *See*—
Beckman, Leo H. J. F.; and Oomea, Gysbert L., 4,701,049, Cl. 356-1.000.
Oono, Hiroshi; and Oosaka, Shigenori, to Fuji Photo Film Co., Ltd. Optical beam modulation and deflection device. 4,701,674, Cl. 315-276.000.
Oosaka, Shigenori: *See*—
Oono, Hiroshi; and Oosaka, Shigenori, 4,701,674, Cl. 315-276.000.
Opitz, Norbert: *See*—
Lubbers, Dietrich W.; and Opitz, Norbert, 4,701,697, Cl. 324-96.000.
Oppelt, Herbert; and Lechner, Rufolf, to MWB Messwandler-Bau AG. Arrangement for tape winding machines for the compensation of a unilateral tape tension. 4,700,905, Cl. 242-67.10R.
Optical Disc Corporation: *See*—
Dakin, W. Ray; and Browne, John F. N., 4,701,603, Cl. 250-201.000.
Orbanic, Robert S., to GTE Products Corporation. Electrical connector with compliant section. 4,701,140, Cl. 439-751.000.
Ormat Turbines (1965) Ltd.: *See*—
Krieger, Zvi; and Moritz, Alex, 4,700,543, Cl. 60-655.000.
Orosa, Jose S. Knockdown furnitures and the structural components therefor. 4,701,065, Cl. 403-263.000.
Orwin, John P. Strap device for reinforcing luggage and the like. 4,700,818, Cl. 190-27.000.
Osanai, Akinori, to Toyota Jidosha Kabushiki Kaisha. Control device in continuously variable transmission system for vehicle. 4,701,853, Cl. 364-424.100.
Osborn, Paul R.: *See*—
Swinkels, Dominicus A.; Fredericks, Peter M.; and Osborn, Paul R., 4,701,838, Cl. 364-164.000.
Osborn, Scott E.; Farrugia, Vincent J.; Plischke, LeMoyne W.; and Wu, Chester C., to Monsanto Company. Antimicrobial nylon prepared in water with zinc compound and phosphorus compound. 4,701,518, Cl. 528-336.000.
Oshida, Yoshitada; Shiba, Masataka; Nakashima, Naoto; Nakata, Toshihiko; and Uto, Sachio, to Hitachi, Ltd. Semiconductor exposure apparatus and alignment method therefor. 4,701,050, Cl. 356-152.000.
Oshima, Toshio: *See*—
Saito, Yasunori; Ichikawa, Osamu; and Oshima, Toshio, 4,701,015, Cl. 350-96.230.
Osmond, Max R. V. Power supply circuit including a trip-switch, and an electrical outlet. 4,701,733, Cl. 335-18.000.
Osmundson, Michael D.: *See*—
Judkins, Kenneth R.; and Osmundson, Michael D., 4,701,213, Cl. 75-27.000.
Ostrow, Barnet D.: *See*—
Nobel, Fred I.; and Ostrow, Barnet D., 4,701,244, Cl. 204-44.400.
Ota, Isamu; Nishimura, Yutaka; Nishio, Shigeru; and Yogo, Kenji, to Toyota Jidosha Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Fuel vapor control device. 4,700,682, Cl. 123-516.000.
Ota, Masako: *See*—
Hasegawa, Kenji; Nakashima, Koichi; Eguchi, Tohru; and Ota, Masako, 4,701,320, Cl. 424-54.000.
Otala, Matti, to Kone Elevator GmbH. Method of controlling an elevator. 4,700,810, Cl. 187-101.000.
Otis Elevator Company: *See*—
Fossati, Giorgio; Terry, Harold; and Manco, Giuseppe, 4,700,748, Cl. 137-877.000.
Lazar, Gustav, 4,700,809, Cl. 187-1.00R.
Otobe, Yutaka; Kato, Akira; and Chikamatsu, Masataka, to Honda Giken Kogyo K.K. Method of controlling fuel supply for internal combustion engine at idle. 4,700,675, Cl. 123-339.000.
Otobe, Yutaka; Kato, Akira; Hosoda, Fumio; and Takagi, Akinobu, to Honda Giken Kogyo K.K. Intake air quantity control method for internal combustion engines. 4,700,679, Cl. 123-327.000.
Otomo, Shigekazu: *See*—
Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, 4,701,819, Cl. 360-122.000.
Otsuki, Toshinori: *See*—
Ikemoto, Yoshihiro; Kataoka, Jiro; Otsuki, Toshinori; and Nakamura, Takuji, 4,701,810, Cl. 358-296.000.
Ott, Robert J., to American Technologies, Inc. Ink jet fluid for radiology. 4,701,942, Cl. 378-156.000.
Ott, Robert S., to R. Funk & Co., Inc. Buckle chute folder with clamp. 4,701,155, Cl. 493-14.000.
Overton, Bob J.: *See*—
Gartside, Charles H., III; Levy, Alvin C.; Overton, Bob J.; and Taylor, Carl R., 4,701,016, Cl. 350-96.230.
Ovshinsky, Stanford R.; Allred, David D.; Walter, Lee; and Hudgens, Stephen J., to Energy Conversion Devices, Inc. Method of depositing thin films using microwave energy. 4,701,343, Cl. 427-39.000.
Owens-Illinois Closure Inc.: *See*—
Gregory, James L., 4,700,859, Cl. 215-252.000.
Owens-Illinois, Inc.: *See*—
Li, Ernest L., 4,700,860, Cl. 215-256.000.

Sturgill, Dennis T., 4,701,612, Cl. 250-223.00B.

Oxford Magnet Technology Limited: *See*—
McDougall, Ian L.; and Bird, John M., 4,701,736, Cl. 335-299.000.

Oy Partek AB: *See*—
Tiljander, Ossi, 4,700,613, Cl. 91-485.000.

Oy Safematic Ltd.: *See*—
Kuusela, Juhani; Lopperi, Esko; Lummila, Markku; Saksala, Pertti; Salovaara, Esa; Suhonen, Tuomo; Perttina, Harri; Poikolainen, Esko; and Trygg, Hannu, 4,700,953, Cl. 277-38.000.

Ozaki, Masaru: *See*—
Arakawa, Tatsumi; Ozaki, Masaru; and Ikeda, Yukihiro, 4,701,317, Cl. 423-445.000.

Ozaki, Minoru: *See*—
Tanaka, Kunimaro; and Ozaki, Minoru, 4,701,812, Cl. 360-32.000.

Ozawa, Masakazu: *See*—
Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, 4,701,766, Cl. 346-1.100.

Ozen Corporation: *See*—
Koike, Eishi, 4,701,681, Cl. 318-16.000.

Pabsch, Arno R. E. K., to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Boom of the wishbone-type for sailing boards. 4,700,647, Cl. 114-39.000.

Padgett, Lonnie W., Jr.; and Davis, Charles L., to Kimberly-Clark Corporation. Method for packing flexible, flat packages into a carton. 4,700,841, Cl. 206-499.000.

Paetz, Klaus-Christian: *See*—
Dicke, Hans-Rudolf; Bottenbruch, Ludwig; Wedemeyer, Karl-fried; Paetz, Klaus-Christian; and El Sayed, Aziz, 4,701,515, Cl. 528-176.000.

Pagliuca, Emanuel J., to TII Industries, Inc. Line protector. 4,701,825, Cl. 361-119.000.

Pahade, Ravindra F.: *See*—
Hanson, Thomas C.; Fisher, Theodore F.; Weber, Joseph A.; and Pahade, Ravindra F., 4,701,201, Cl. 62-27.000.

Palac, Kazimir, to Zenith Electronics Corporation. Groove and ball registration system for a CRT flat panel. 4,701,666, Cl. 313-407.000.

Pall Corporation: *See*—
Kauke, Heinz, 4,701,861, Cl. 364-502.000.

Panafacom Limited: *See*—
Ikeda, Kazuhiko; and Kawamura, Makoto, 4,701,846, Cl. 364-200.000.

Paper Converting Machine Company: *See*—
Craig, Grantland A., 4,701,239, Cl. 156-519.000.

Paper-Pak Products, Inc.: *See*—
Larsonneur, Lionel M., 4,701,156, Cl. 493-418.000.

Papst-Motoren GmbH & Co KG: *See*—
Merkle, Alfred; Moosmann, Georg; and Muller, Rolf, 4,701,653, Cl. 310-152.000.
Schmider, Fritz, 4,701,655, Cl. 310-237.000.

Paquette, Edmund T.: *See*—
Beam, John W.; and Paquette, Edmund T., 4,701,066, Cl. 403-298.000.

Paradis, Gilles: *See*—
Morey, Jean-Michel; and Paradis, Gilles, 4,701,225, Cl. 148-132.000.

Pardo, Jorge, to National Concrete Masonry Association. Concrete masonry block wall cladding construction system and blocks for same. 4,700,527, Cl. 52-763.000.

Pardo, Rene: *See*—
Hobbins, Martin E.; Dickie, Robert G.; and Pardo, Rene, 4,701,801, Cl. 353-245.000.

Parikh, Dakshesh D.: *See*—
Davis, Walter L.; and Parikh, Dakshesh D., 4,701,943, Cl. 379-57.000.

Park, Hee C. P., to Mobil Oil Corporation. Foamed, opaque, oriented polymeric film structure and process for its manufacture. 4,701,370, Cl. 428-314.400.

Parker, Dane K.: *See*—
Mate, Robert D.; Parker, Dane K.; and Blackwell, James C., 4,701,507, Cl. 526-208.000.

Parker, Theodore L., to Dow Chemical Company, The. Isocyanate adducts with benzoxazolones or benzoxazinediones and use thereof as latent chain extenders or cross-linkers for epoxides. 4,701,512, Cl. 528-45.000.

Parker, Thomas J., to American Cyanamid Company. Process for the manufacture of a stick push-up device. 4,700,448, Cl. 29-434.000.

Parks, Stephen K., to Medical Innovations Corporation. Gastrostomy feeding device. 4,701,163, Cl. 604-178.000.

Parr, Deborah J.: *See*—
Glaug, Frank S.; Luceri, Thomas J.; and Parr, Deborah J., 4,701,178, Cl. 604-387.000.

Pasco Laboratories, Inc.: *See*—
Naylor, Harry B., 4,701,412, Cl. 435-30.000.

Patel, Ranjan C.; Ferguson, Ian J.; and Pennicott, Herbert J., to Minnesota Mining and Manufacturing Company. Oxidative imaging. 4,701,402, Cl. 430-332.000.

Patsy, Samuel M. Programmable moving target soccer practice. 4,700,952, Cl. 273-369.000.

Patterson, Charles E. Device for cleaning paint rollers. 4,700,728, Cl. 134-138.000.

Patterson, Daryll D.: *See*—
Hamernik, Edward L.; and Patterson, Daryll D., 4,700,735, Cl. 137-270.000.

Paugstat, John F.: *See*—
Cone, Richard E.; and Paugstat, John F., 4,700,656, Cl. 177-245.000.

Paul Forkardt GmbH & Co.: *See*—
Kempken, Rainer; and Stolzenberg, Hans, 4,700,957, Cl. 279-117.000.

Pavie, Claude: *See*—
Courjaret, Francois; Del Fabbro, Gilbert; Devic, Jean-Noel; Divoux, Michel; Forella, Guy; Hamant, Jean-Pierre; Tubiana, Dominique; and Pavie, Claude, 4,701,094, Cl. 414-330.000.

Pearce, P. Glenn, to Teledyne Industries, Inc. Two stage fuel pump. 4,700,680, Cl. 123-383.000.

Pearlman, Barry; and Menke, W. Kenneth, to Public Safety Equipment, Inc. Signal apparatus. 4,701,743, Cl. 340-84.000.

Pearson, Richard K.; Bystroff, Roman I.; and Miller, Dale E., to United States of America, Energy. Boron hydride polymer coated substrates. 4,701,379, Cl. 428-427.000.

Pease, Robert A., to National Semiconductor Corporation. Isolation diffusion process monitor. 4,701,779, Cl. 357-48.000.

Pedigo, Michael K. Carrier current transceiver. 4,701,945, Cl. 379-66.000.

Peek, Hermanus L., to U.S. Philips Corporation. Method of manufacturing a semiconductor device with overlapping strip electrodes. 4,700,459, Cl. 437-53.000.

Peffley, Richard D.: *See*—
Burchell, Donald J., Jr.; and Peffley, Richard D., 4,701,476, Cl. 521-159.000.

Peiffer, Dennis G.: *See*—
Mintz, Donald J.; Peiffer, Dennis G.; Thaler, Warren A.; and Duvdevani, Ilan, 4,701,263, Cl. 210-728.000.

Pekarek, William R., to Westinghouse Electric Corp. Apparatus and method for removing thermocouples from nuclear reactor vessel. 4,701,297, Cl. 376-260.000.

Pekny, Robert E. Marine anchor. 4,700,652, Cl. 114-303.000.

Pelletier, Marc G.: *See*—
Hildebrandt, Paul R.; and Pelletier, Marc G., 4,701,131, Cl. 434-211.000.

Pellon, Brian J.: *See*—
Hughes, Michael P.; and Pellon, Brian J., 4,701,489, Cl. 524-349.000.

Penney, Bruce J.; and Taylor, Stewart S., to Tektronix, Inc. Digitally selectable, multiple current source proportional to a reference current. 4,701,694, Cl. 323-317.000.

Penney, Carl M.; and Thomas, Bradley S., to General Electric Company. Prism telescope to match optical requirements for acousto-optic deflector. 4,701,031, Cl. 350-371.000.

Pennicott, Herbert J.: *See*—
Patel, Ranjan C.; Ferguson, Ian J.; and Pennicott, Herbert J., 4,701,402, Cl. 430-332.000.

Pepe, Enrico J.: *See*—
Mohr, Paul H.; and Pepe, Enrico J., 4,701,277, Cl. 252-75.000.

Perbet, Jean-Noel: *See*—
Le Pesant, Jean-Pierre; Hareng, Michel; Mourey, Bruno; and Perbet, Jean-Noel, 4,701,021, Cl. 350-267.000.

Percec, Virgil, to B.F. Goodrich Company. Difunctionalized polyarylene polyethers and process for preparation thereof. 4,701,514, Cl. 528-174.000.

Percival, William S.: *See*—
Willard, Reginald A.; and Percival, William S., 4,701,711, Cl. 324-322.000.

Peret, Scot F.: *See*—
Keranen, John J.; Peret, Scot F.; and Stewart, David R., 4,701,578, Cl. 200-5.00B.

Perfection Spring & Stamping Corp.: *See*—
Seyler, Peter G., 4,700,981, Cl. 296-1.00F.

Perfetti, Thomas A.: *See*—
Townsend, David E.; Frye, Diane R.; Greene, Tammie B.; and Perfetti, Thomas A., 4,700,726, Cl. 131-364.000.

Perlegos, Gust; and Wu, Tsung-Ching, to Seeq Technology, Inc. MOS floating gate memory cell and process for fabricating same. 4,701,776, Cl. 357-23.500.

Perlmutter, Robert J., to Stanford University. Optical-digital hologram recording. 4,701,006, Cl. 350-3.660.

Perry, Steven B.: *See*—
Lynch, Daniel; and Perry, Steven B., 4,701,949, Cl. 379-179.000.

Persicke, Gunter; Child, James R.; and Baker, Peter F., to Quinton Hazell plc. Vehicle suspension system. 4,700,815, Cl. 188-286.000.

Person, Joel I.; and Gjelsvik, Atle, to Person, Joel I. Composite floor system. 4,700,519, Cl. 52-334.000.

Personal Products, Inc.: *See*—
Glaug, Frank S.; Luceri, Thomas J.; and Parr, Deborah J., 4,701,178, Cl. 604-387.000.

Perthus, Peter: *See*—
Glaser, Gerhard; Lindae, Gerhard; Perthus, Peter; and Rein, Heinz, 4,701,834, Cl. 362-307.000.

Perttina, Harri: *See*—
Kuusela, Juhani; Lopperi, Esko; Lummila, Markku; Saksala, Pertti; Salovaara, Esa; Suhonen, Tuomo; Perttina, Harri; Poikolainen, Esko; and Trygg, Hannu, 4,700,953, Cl. 277-38.000.

Perutz, Gerald E. A.: *See*—
Perutz, Simon G. A.; and Perutz, Gerald E. A., 4,700,498, Cl. 40-603.000.

Perutz, Simon G. A.; and Perutz, Gerald E. A., to Nimlok Company. Portable display apparatus. 4,700,498, Cl. 40-603.000.

Peterle, Guido. Molding machine for molding-sand cores. 4,700,767, Cl. 164-201.000.

Peters, Stanley T.; Kolek, Robert L.; Guenther, Rolf A.; Anderson, Jeffrey J.; and Marshall, Clarence F., to Westinghouse Electric Corp.

Method of forming a joint between a tubular composite and a metal ring. 4,701,231, Cl. 156-172.000.

Petri, Volker: *See—*
Andres, Rudolf; Knoll, Heinz; Petri, Volker; and Pfistner, Harald, 4,700,974, Cl. 280-806.000.

Petrolite Corporation: *See—*
Hakim, John, 4,701,487, Cl. 524-229.000.

Petrosian, Misha S.: *See—*
Martyshenko, Jury P.; Martyshenko, Sergei J.; Kotelnikov, Jury S.; Kutukhtin, Evgeny G.; Ilyasova, Nelli I.; Volkov, Jury S.; Vardanian, Armenak M.; and Petrosian, Misha S., 4,701,075, Cl. 405-217.000.

Petrovic, Ljubisa M., to Well Improvement Specialists, Inc. Sand control devices and method of installation thereof. 4,700,776, Cl. 166-157.000.

Pettinga, Robert; Dix, Joseph; McHugh, Thomas O.; Sibley, Lincoln L., Jr.; Ziemba, Richard T.; and Forrester, Victor J., to General Electric Company. Machine gun. 4,700,608, Cl. 89-11.000.

Pezdirtz, George F.: *See—*
Giatras, James L.; Mang, Warren G.; Marino, Charles P.; Needling, Michael C.; and Pezdirtz, George F., 4,701,345, Cl. 427-45.100.

Pfister GmbH: *See—*
Hafner, Hans W., 4,700,566, Cl. 73-147.000.

Pfister, Hans, to Swiss Aluminium Ltd. Electropneumatic drive system for crust breaking devices and process for operating the same. 4,700,612, Cl. 91-471.000.

Pfistner, Harald: *See—*
Andres, Rudolf; Knoll, Heinz; Petri, Volker; and Pfistner, Harald, 4,700,974, Cl. 280-806.000.

Pflieger, David C.: *See—*
Bastian, John M.; Pflieger, David C.; and Beck, Marshall K., 4,700,916, Cl. 248-225.200.

Philip Morris Incorporated: *See—*
Chan, W. Geoffrey; and Houminer, Yoram, 4,701,282, Cl. 260-410.90R.
Geiszler, Willard A., Jr., 4,700,725, Cl. 131-336.000.

Phillips, Richard B.; Plummer, Ernest L.; and Engel, John F., to FMC Corporation. Fluoropyridinylmethyl cyclopropanecarboxylate insecticides. 4,701,464, Cl. 514-345.000.

Phillips, Robert F.: *See—*
Kalnins, John M.; McIntyre, James A.; Moyer, John R.; Phillips, Robert F.; and Snoble, Karel A. J., 4,701,247, Cl. 204-131.000.

Phoenix Terminal Blocks Inc.: *See—*
Key, Edward H., 4,701,138, Cl. 439-417.000.

Pichant, Patrick, to Akzo N.V. Liquid coating composition containing lubricants. 4,701,382, Cl. 428-457.000.

Picker International, Inc.: *See—*
Haacke, E. Mark, 4,701,706, Cl. 324-309.000.

Pickett, John E. P. Microtome disposable blade apparatus. 4,700,600, Cl. 83-165.000.

Pilpel, Edward D.: *See—*
Meatto, Franklin D.; and Pilpel, Edward D., 4,700,967, Cl. 280-609.000.

Pine, Lloyd A., to Exxon Research and Engineering Company. Rare earth stabilized aluminum deficient zeolite. 4,701,431, Cl. 502-73.000.

Pioneer Electronic Corporation: *See—*
Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, 4,701,902, Cl. 369-77.100.

Pippert, Aaron J., to Utex Industries, Inc. Fishing lure. 4,700,503, Cl. 43-42.090.

Pirello, Robert J. Process for preparing a tofu cheese and product. 4,701,332, Cl. 426-302.000.

Piro, Ronald A., to International Business Machines Corporation. Substrate bias generators. 4,701,637, Cl. 307-297.000.

Pischinger, Franz; and Kreuter, Peter, to FEV Forschungsgesellschaft fur Energietechnik und Verbrennungsmotoren mbH. Method of controlling reciprocating four-stroke internal combustion engines. 4,700,684, Cl. 123-568.000.

Pismen, Moshe: *See—*
Esterson, Gerald; Pismen, Moshe; and Aizenshtat, Zeev, 4,700,639, Cl. 110-347.000.

Pissiotas, Georg: *See—*
Topfl, Werner; and Pissiotas, Georg, 4,701,206, Cl. 71-90.000.

Pisz, Frank A.; and Agliano, William S., to Westinghouse Electric Corp. Stationary blade assembly for a steam turbine. 4,701,102, Cl. 415-136.000.

Pitney Bowes Inc.: *See—*
Beck, Christian A.; Breslawsky, Marc C.; and Forster, Hans R., 4,701,233, Cl. 156-217.000.
DiGiulio, Peter C.; Hafner, Warren G.; and Stalzer, Henry, 4,701,856, Cl. 364-466.000.

Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Miller, Kevin P.; and Wiener, Charles, to International Flavors & Fragrances Inc. Thioalkanoic acid esters of phenylalkanols. 4,701,548, Cl. 560-152.000.

Pittman, John N.: *See—*
Lindsay, Erin J.; and Pittman, John N., 4,701,160, Cl. 604-53.000.

Plant Genetics, Inc.: *See—*
Nelsen, Charles E.; and Mannion, Catharine, 4,701,326, Cl. 424-408.000.

Pless, Emory J.: *See—*
Fenn, Robert W., III; Pless, Emory J.; Harris, Richard L.; and O'Leary, Kevin, 4,701,250, Cl. 204-283.000.

Plessey Overseas Limited: *See—*
Carter, Christopher F., 4,701,619, Cl. 250-338.000.

Plischke, LeMoyne W.: *See—*
Osborn, Scott E.; Farrugia, Vincent J.; Plischke, LeMoyne W.; and Wu, Chester C., 4,701,518, Cl. 528-336.000.

PLM AB: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,701,121, Cl. 425-526.000.

Ploeger, Walter, Jr. Printing ribbon spool. 4,701,062, Cl. 400-202.100.

Plomer, Anton: *See—*
Beisswanger, Rudolf; Wohrle, Albert, deceased; and Plomer, Anton, 4,700,658, Cl. 118-67.000.

Plummer, Ernest L.: *See—*
Phillips, Richard B.; Plummer, Ernest L.; and Engel, John F., 4,701,464, Cl. 514-345.000.

Plummer, William T., to Polaroid Corporation. Method and apparatus for reducing optical artifacts. 4,701,045, Cl. 355-20.000.

Pneumo Abex Corporation: *See—*
Dirkin, William, 4,700,868, Cl. 220-465.000.

Poikolainen, Esko: *See—*
Kuusela, Juhani; Lopperi, Esko; Lummila, Markku; Saksala, Pertti; Salovaara, Esa; Suhonen, Tuomo; Perttina, Harri; Poikolainen, Esko; and Trygg, Hannu, 4,700,953, Cl. 277-38.000.

Polaroid Corporation: *See—*
Johnson, Bruce K., 4,701,039, Cl. 354-80.000.
Miller, Douglas E., 4,701,040, Cl. 354-109.000.
Plummer, William T., 4,701,045, Cl. 355-20.000.

Poleshuk, Michael: *See—*
Anderson, Robert W.; and Poleshuk, Michael, 4,701,772, Cl. 346-160.000.

Pollock, Eugene N., to Nuclear Metals, Inc. Method and apparatus for producing uranyl peroxide ($UO_4.2H_2O$) from uranium and uranium alloy pieces. 4,701,310, Cl. 423-16.000.

Pollok, Peter: *See—*
Schmid, Anton; Tauschek, Georg; Sedlmeier, Andreas; and Pollok, Peter, 4,700,446, Cl. 29-159.200.

Polyhitech: *See—*
Jones, Graeme P., 4,701,134, Cl. 439-43.000.

Ponzi, Ugo: *See—*
Arduini, Carlo; Barboni, Renato; Castellani, Antonio; Ponzi, Ugo; Bielli, Paolo; and Contu, Salvatore, 4,701,765, Cl. 343-897.000.

Poole, Joseph J., to RCA Corporation. Parallel distributed signal amplifiers. 4,701,716, Cl. 330-43.000.

Porath, Jerker. Metal ion binding product to inhibit bacterial growth for the immobilization and purification of biopolymers and the like. 4,701,500, Cl. 525-380.000.

Portenhauser, Rudolf; and Bartl, Knut, to Boehringer Mannheim GmbH. Control or calibration serum for lipid diagnosis. 4,701,417, Cl. 436-13.000.

Porter, John S.: *See—*
Kornreich, Wayne D.; Anderson, Harry A.; Porter, John S.; and Rivier, Jean E. F., 4,701,499, Cl. 525-333.300.

Post, James L.: *See—*
Radwanski, Fred R.; Lau, Jark C.; and Post, James L., 4,701,294, Cl. 264-518.000.

Postal, Jeffrey J.: *See—*
Head, Glenn D., Jr.; and Postal, Jeffrey J., 4,700,641, Cl. 111-85.000.

Potter, Raymond G., to Du Pont de Nemours, E. I., and Company. Laminated arm composite centrifuge rotor. 4,701,157, Cl. 494-16.000.

Powell, Justin C., to Texaco Inc., White. Cyclized unsaturated keto acids. 4,701,553, Cl. 562-504.000.

Powell, Paul E. Combination mirror defogging and drying device. 4,701,594, Cl. 219-219.000.

Powell, Theo J.; and Hwang, Yin-Chao, to Texas Instruments Incorporated. Modularized scan path for serially tested logic circuit. 4,701,921, Cl. 371-25.000.

Powers, Richard G.; Schack, Warren R.; Alley, Lewis F.; and Anderson, James E., to Marlen Research Corporation. Continuous vacuum grinding method and apparatus. 4,700,899, Cl. 241-30.000.

Pozzobon, Alessandro, to NORDICA S.p.A. Boot, in particular ski boot, with a monolithic structure. 4,700,496, Cl. 36-117.000.

Prasil, Bernard; and Turbe, Jean-Pierre, to Societe Nationale des Chemins de Fer Francais; and Matix-Industries. Device for automatically identifying catenary posts of a railway track to locate faults detected on the railway track. 4,700,564, Cl. 73-146.000.

Pratt Burnerd International Limited: *See—*
Jackson, Joseph F., 4,700,955, Cl. 279-4.000.

Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co.: *See—*
Reuss, Oswald; and Rutterschmidt, Franz, 4,701,740, Cl. 338-164.000.

Preissinger, Norbert; and Bogdan, Teofil, to MWB Messwandler-Bau AG. High-voltage current transformer. 4,701,738, Cl. 336-92.000.

Prescolite, Inc.: *See—*
Lasker, Martin L., 4,701,832, Cl. 362-281.000.

Pretzer, Gale H.: *See—*
Kookootsedes, Gust J.; Reese, Herschel H.; Gutek, Beth I.; and Pretzer, Gale H., 4,701,017, Cl. 350-96.340.

Pricer, Wilbur D., to International Business Machines Corporation. BICMOS binary logic circuits. 4,701,642, Cl. 307-446.000.

Pridgen, Danny W. Apparatus for drying hair spray and other compositions. 4,700,494, Cl. 34-90.000.

Print-Lock Corporation: *See—*
Butland, Charles L., 4,700,657, Cl. 118-31.500.

Probst, Georg, to GMT Novotny GmbH. Current leadthrough. 4,700,999, Cl. 439-271.000.

Procter & Gamble Company, The: *See—*
Dixon, Thomas J.; and Uchtman, Vernon A., 4,701,322, Cl. 424-70.000.
Woo, Ricky A., 4,701,319, Cl. 424-52.000.

Prorok, Maryfrances: *See—*
Koermer, Gerald S.; Gutierrez, Eddie N.; and Prorok, Maryfrances, 4,701,527, Cl. 544-277.000.

Protectaire Systems Co.: *See—*
Napadow, Stanley C., 4,700,615, Cl. 98-115.200.

Provonchee, Richard B., to FMC Corporation. Indicator device for substance receiving wells in a microtiter plate. 4,701,754, Cl. 340-815.030.

Przewalski, Zygmunt J., to M & S Engineering and Manufacturing Co., Inc. Method and apparatus for soil detoxification. 4,700,638, Cl. 110-346.000.

Public Safety Equipment, Inc.: *See—*
Pearlman, Barry; and Menke, W. Kenneth, 4,701,743, Cl. 340-84.000.

Puigserver, Antoine: *See—*
Bercovici, Daniel; Gaertner, Hubert; and Puigserver, Antoine, 4,701,328, Cl. 426-2.000.

Purcell, Thomas; and Zard, Lydia, to Synthelabo. Dibenz[be]oxepinacetic acid derivatives, the preparation thereof and their application in therapy. 4,701,466, Cl. 514-450.000.

Puumalainen, Pertti, to Puumalaisen Tutkimuslaitos Oy. Measuring the thickness for a continuous material web. 4,700,486, Cl. 33-147.00L.

Puumalaisen Tutkimuslaitos Oy: *See—*
Puumalainen, Pertti, 4,700,486, Cl. 33-147.00L.

Quaker Oats Company, The: *See—*
Moomaw, David E., 4,701,147, Cl. 446-145.000.

Quality Jewelry, Inc.: *See—*
Haley, Richard J., 4,700,552, Cl. 63-12.000.

Quanzhong, Sun: *See—*
Yuan, Ren; Xianzhi, Chen; Yuanxi, Feng; Guojiu, Li; Dake, Huang; Yongli, Zhang; and Quanzhong, Sun, 4,701,689, Cl. 322-19.000.

Quast, Douglas A.: *See—*
Samuelson, John P.; and Quast, Douglas A., 4,700,730, Cl. 135-67.000.

Quek, Swee-meng: *See—*
Thompson, Richard F.; Disney, Daniel J.; Quek, Swee-meng; and Westerfeld, Eric C., 4,701,844, Cl. 364-200.000.

Quinn, James R.: *See—*
Andersen, Garry E.; Quinn, James R.; and Linnert, Peter J., 4,701,114, Cl. 417-564.000.

Quinton Hazell plc: *See—*
Persicke, Gunter; Child, James R.; and Baker, Peter F., 4,700,815, Cl. 188-286.000.

R. Funk & Co., Inc.: *See—*
Ott, Robert S., 4,701,155, Cl. 493-14.000.

R. J. Reynolds Tobacco Company: *See—*
Townsend, David E.; Frye, Diane R.; Greene, Tammie B.; and Perfetti, Thomas A., 4,700,726, Cl. 131-364.000.

R. W. Simon Limited: *See—*
Dudzik, Henryk, 4,700,614, Cl. 98-98.000.

Rader, Delbert L. Exercise apparatus. 4,700,945, Cl. 272-127.000.

Radermacher, Wilhelm; and Czech, Johannes, to ANT Nachrichtentechnik GmbH. Operating point-stabilized linearized traveling wave tube amplifier. 4,701,717, Cl. 330-149.000.

Radwanski, Fred R.; Lau, Jark C.; and Post, James L., to Kimberly-Clark Corporation. Eductor airforming apparatus. 4,701,294, Cl. 264-518.000.

Radzikovsky, Alexandr N.: *See—*
Levchenko, Georgy T.; and Radzikovsky, Alexandr N., 4,700,660, Cl. 118-726.000.

Raftery, William. Furniture support. 4,700,430, Cl. 16-18.0CG.

Rainey, Tommy D.: *See—*
Cain, Jerry T.; Mason, James M.; and Rainey, Tommy D., 4,701,087, Cl. 410-94.000.

Rajala, Gregory J.: *See—*
Kellenberger, Stanley R.; Rajala, Gregory J.; and Stevens, Robert A., 4,701,179, Cl. 604-394.000.
Wilson, John C.; Stevens, Robert A.; Boland, Leona G.; Rajala, Gregory J.; and Kellenberger, Stanley R., 4,701,170, Cl. 604-385.00A.

Ramachandran, Sundaresan; Skiles, David O.; and Hansen, Donald J., to Umetco Minerals Corporation. Method of operating a heap leach for recovering uranium and vanadium. 4,701,309, Cl. 423-20.000.

Ramirez de Agudelo, Magdalena M.: *See—*
Garcia, Juan J.; Galiasso, Roberto E.; Ramirez de Agudelo, Magdalena M.; Rivas, Luis; and Hurtado, Juan, 4,701,435, Cl. 502-252.000.

Ramon, Charles L.: *See—*
Leenders, Luc H.; Ramon, Charles L.; and Daems, Edie R., 4,701,401, Cl. 430-257.000.

Randall, Pamela M. Jewelry clasp. 4,700,438, Cl. 24-599.000.

Rangert, Bo R.; and Alm, Christer L., to AB Electrolux. Base structure of a motor saw. 4,700,480, Cl. 30-383.000.

Rank Electronic Tubes Limited: *See—*
Bonye, Gordon R., 4,701,789, Cl. 358-65.000.

Ransom, Maurice N.; and Toy, Wing N., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Packet switching network with multiple packet destinations. 4,701,906, Cl. 370-60.000.

Raoux, Daniel, to Commissariat a l'Energie Atomique. Method for positioning moving vehicles and exchanging communications between the vehicles and a central station. 4,701,760, Cl. 340-993.000.

Rappinger, Bo; and Stenkvist, Sven-Einar, to ASEA AB. Electrically conductive bricks. 4,701,931, Cl. 373-72.000.

Raskin, Rubin. Method of manufacturing heat transfer panels by inflation. 4,700,445, Cl. 29-157.30V.

Rath, Heinrich B., to Lucas Industries public limited company. Wheel assembly including a disc brake for vehicles. 4,700,813, Cl. 188-18.00A.

Rath, Heinrich-Bernhard, to Lucas Industries public limited company. Drum brake including three brake shoes. 4,700,816, Cl. 188-323.000.

Rau Fasteners Inc.: *See—*
Chapman, Wayne M., 4,700,449, Cl. 29-513.000.

Rauch, Hans: *See—*
Bonitz, Jorg; Entenmann, Robert; Miller, Bernhard; Rauch, Hans; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, 4,700,677, Cl. 123-425.000.

Rauchberger, Werner: *See—*
Burkhardt, Jurgen; and Rauchberger, Werner, 4,701,490, Cl. 524-425.000.

Rausch, Doyle W., to National Standard Company. Reinforced belt assembly and method of manufacture. 4,701,154, Cl. 474-205.000.

Ray, Eric T., to AMF Incorporated. Knives in cutting machines. 4,700,720, Cl. 131-118.000.

Raychem Corp.: *See—*
Shimirak, Gerlad L.; Hunter, Thomas; Story, Martha F.; Halstead, W. G.; Chan, Paul S.; and Swinmurn, Christopher J., 4,701,574, Cl. 174-93.000.

Raytheon Company: *See—*
Harris, David J.; and Vinn, Charles L., 4,701,641, Cl. 307-445.000.

RCA Corporation: *See—*
den Hollander, Willem; and Leonardi, Giovanni M., 4,701,793, Cl. 358-140.000.
DeVilbiss, Warren C., 4,701,744, Cl. 340-347.0DD.
Dolny, Gary M.; and Goodman, Lawrence A., 4,700,460, Cl. 437-81.000.
Dorsey, Denis P., 4,701,725, Cl. 333-185.000.
Poole, Joseph J., 4,701,716, Cl. 330-43.000.
Schlesier, Kenneth M., 4,701,241, Cl. 156-643.000.
VanSant, Glen J., 4,701,895, Cl. 369-13.000.
Watson, Edwin G., 4,701,894, Cl. 369-13.000.
Willis, Donald H., 4,701,785, Cl. 358-31.000.

Read, Norman W., to Dresser Industries, Inc. Flow control valve for use in oil and gas wells and the like. 4,700,782, Cl. 166-330.000.

Rechtziegel, Bruno: *See—*
Dommer, Erich; Rechtziegel, Bruno; and Tauber, Klaus, 4,701,302, Cl. 420-470.000.

Reczek, James A.: *See—*
Thunberg, Allen L.; and Reczek, James A., 4,701,420, Cl. 436-94.000.

Red Arrow International Inc.: *See—*
Hawkins, Wallace H.; and Gosnell, Calvin B., 4,700,966, Cl. 280-432.000.

Redmond, Sanford. Method and apparatus for making compact packages for spreadable products. 4,700,532, Cl. 53-452.000.

Reese, Herschel H.: *See—*
Kookootsedes, Gust J.; Reese, Herschel H.; Gutek, Beth I.; and Pretzer, Gale H., 4,701,017, Cl. 350-96.340.

Reeve, Richard J.; and Noah, George I. Lightweight, self-powered, transportable crane assembly. 4,700,851, Cl. 212-181.000.

Regan, Michael T.: *See—*
Hung, Yann; Klose, Thomas R.; Regan, Michael T.; and Rossi, Louis J., 4,701,396, Cl. 430-58.000.

Regenass, Franz: *See—*
Brady, Arthur; Kristen, Ulrich; Angerer, Hermann F.; and Regenass, Franz, 4,701,273, Cl. 252-32.500.

Regie Nationale des Usines Renault: *See—*
Galles, Henri; and Elias, Bernard, 4,700,864, Cl. 220-86.00R.

Regimand, Ali, to Troxler Electronic Laboratories, Inc. Apparatus and method for accurately measuring the density of materials with rough surfaces by radiation backscatter. 4,701,868, Cl. 364-558.000.

Regimbeau, Guy; Augelmann, Gerard; and Disdier, Camille, to Rhone-Poulenc Specialties Chimiques. Process for the preparation of N-2-alkenyl-m-trifluoromethylanilines. 4,701,560, Cl. 564-404.000.

Reichmanis, Elsa: *See—*
Novembre, Anthony E.; and Reichmanis, Elsa, 4,701,342, Cl. 427-38.000.

Reilly, Roger D., to Deere & Company. Blower attachment. 4,700,534, Cl. 56-13.300.

Reimche, Heinrich, to Dorst Maschinen- und Analagenbau, Otto Dorst und Dipl.-Ing. Walter Schlegel GmbH & Co. Pressing tool for producing dish-shaped pressed objects, in particular plates, cups, bowls, etc., of powders, preferably ceramic material. 4,701,122, Cl. 425-584.000.

Rein, Heinz: *See—*
Glaser, Gerhard; Lindae, Gerhard; Perthus, Peter; and Rein, Heinz, 4,701,834, Cl. 362-307.000.

Reineman, Richard G. Monocoque building shell. 4,700,514, Cl. 52-86.000.

Reinhard, John F., Jr.: *See—*
Nichol, Charles A.; Reinhard, John F., Jr.; Smith, Gary K.; and Bigham, Eric C., 4,701,455, Cl. 514-249.000.

Remington Products, Inc.: *See—*
Locke, David R.; and Miska, Aivars, 4,700,476, Cl. 30-43.910.

Renco Corporation: *See*—
Carlson, David L., 4,700,711, Cl. 128-660.000.
Research Products Corporation: *See*—
Delany, John J., 4,701,196, Cl. 55-481.000.
Resnick, David R.; and Bach, Randall E., to ETA Systems, Inc. Built-in self-test system for VLSI circuit chips. 4,701,920, Cl. 371-25.000.
Resnick, Semion; and Goldman, Jacob, to Resnick, Semion. Cartridge assembly for a surgical stapling instrument. 4,700,703, Cl. 128-334.00R.
Resolution Research, Inc.: *See*—
Allebest, Edward F.; Hansen, Parley E.; Walsh, George A.; and Maguire, Walter R., 4,701,896, Cl. 369-32.000.
Resopal Werk H. Rommler GmbH: *See*—
Werres, Willy, 4,701,232, Cl. 156-211.000.
Rettig, Vernon E.: *See*—
Bartusek, Robert J.; Steilen, Ronald M.; and Rettig, Vernon E., 4,700,785, Cl. 172-705.000.
Retzer, Michael H.: *See*—
Howard, Scott P.; Kozlowski, Ted A.; and Retzer, Michael H., 4,701,944, Cl. 379-63.000.
Reuss, Oswald; and Rutterschmidt, Franz, to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co. Rheostatic devices. 4,701,740, Cl. 338-164.000.
Revici, Emanuel, to Avram, Elena. Treatment of symptoms of neoplastic diseases with nucleoproteins. 4,701,442, Cl. 514-21.000.
Reynaud, Gary L.; and Allcorn, Calbert, to Yarbrough'o Machine Shop. Pallet dispenser. 4,701,092, Cl. 414-115.000.
Reynolds, Desmond H. J., to Lucas Industries public limited company. Brake pressure control valve. 4,700,990, Cl. 303-9.690.
Reynolds, Gary R.: *See*—
Dunkerton, Stephen H.; Erickson, Gary D.; and Reynolds, Gary R., 4,701,758, Cl. 340-825.480.
Rhea, Troy E., Jr. Color-coded ruler for three-phase wiring. 4,700,491, Cl. 33-494.000.
Rhodes, Barry V. Enthalpic heat pump desiccant air conditioning system. 4,700,550, Cl. 62-271.000.
Rhone-Poulenc Chimie de Base: *See*—
Le Ludec, Joel; Macharat, Jean; Morawski, Jean-Claude; and Soula, Gerard, 4,701,492, Cl. 524-493.000.
Rhone-Poulenc Specialites Chimiques: *See*—
DesBois, Michel; and Amiet, Louis, 4,701,551, Cl. 560-226.000.
Rhone-Poulenc Specialties Chimiques: *See*—
Francese, Catherine; Tordeux, Marc; and Wakselman, Claude, 4,701,569, Cl. 568-812.000.
Regimbeau, Guy; Augelmann, Gerard; and Disdier, Camille, 4,701,560, Cl. 564-404.000.
Richard, Fred V.; Hickernell, Fred S.; and Cho, Frederick Y., to Motorola, Inc. Optical waveguide including superstrate of niobium or silicon oxynitride and method of making same. 4,701,008, Cl. 350-96.120.
Richard, Jean P.: *See*—
Bullen, Ronald S.; Mzik, Joseph; and Richard, Jean P., 4,701,270, Cl. 252-8.551.
Richardson, Bruce A., to Northern Telecom Limited. Direct coupled FET logic using a photodiode for biasing or level-shifting. 4,701,646, Cl. 307-570.000.
Ricoh Co., Ltd.: *See*—
Hirakura, Koji; and Ikesue, Masumi, 4,700,659, Cl. 118-652.000.
Serikawa, Yoshio, 4,701,041, Cl. 354-413.000.
Riedl, Hermann, to Siemens Aktiengesellschaft. Magnetic resonance diagnostic device. 4,701,707, Cl. 324-309.000.
Riedmaier, Josef: *See*—
Lucius, Werner; Mosig, Ernst; and Riedmaier, Josef, 4,700,889, Cl. 237-12.30C.
Rikumaru, Hiroshi: *See*—
Watanabe, Hiroyuki; and Rikumaru, Hiroshi, 4,701,267, Cl. 210-806.000.
Riley, John T. Process for removing sulfur from coal. 4,701,183, Cl. 44-1.0SR.
Ringermacher, Harry I.; and Williams, Richard S., to United Technologies Corporation. Broadband acoustic point-contact transducer. 4,701,658, Cl. 310-334.000.
Rissanen, Vilppu U., to Oljynpuristamo Oy. Threshing method and equipment intended for its application. 4,700,718, Cl. 130-27.00R.
Ritter, Russell F. Sterile mattress unit. 4,700,418, Cl. 5-449.000.
Rittmannsberger, Norbert: *See*—
Gademann, Lothar; Mattes, Bernhard; Mausner, Eberhard; Suchowerskyj, Wadym; and Rittmannsberger, Norbert, 4,700,973, Cl. 280-735.000.
Rivas, Luis: *See*—
Garcia, Juan J.; Galiasso, Roberto E.; Ramirez de Agudelo, Magdalena M.; Rivas, Luis; and Hurtado, Juan, 4,701,435, Cl. 502-252.000.
Rivier, Jean E. F.: *See*—
Kornreich, Wayne D.; Anderson, Harry A.; Porter, John S.; and Rivier, Jean E. F., 4,701,499, Cl. 525-333.300.
Robert Bosch GmbH: *See*—
Bonitz, Jorg; Entenmann, Robert; Miller, Bernhard; Rauch, Hans; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, 4,700,677, Cl. 123-425.000.
Denz, Helmut, 4,700,673, Cl. 123-325.000.
Gademann, Lothar; Mattes, Bernhard; Mausner, Eberhard; Suchowerskyj, Wadym; and Rittmannsberger, Norbert, 4,700,973, Cl. 280-735.000.
Glaser, Gerhard; Lindae, Gerhard; Perthus, Peter; and Rein, Heinz, 4,701,834, Cl. 362-307.000.
Hans, Waldemar; Kind, Wilhelm; Knapp, Heinrich; Kramer, Wolfgang; and Sauer, Rudolf, 4,700,891, Cl. 239-132.500.
Schirmer, Guenter; and Woelffing-Seelig, Gerhard, 4,701,596, Cl. 219-483.000.
Robert Krups Stiftung & Co. KG.: *See*—
Henn, Stefan, 4,700,903, Cl. 241-101.200.
Roberts, Harold, to ADC Fiber Optics Corporation. Unitary body optical coupler. 4,701,010, Cl. 350-96.150.
Robertson, Nathaniel: *See*—
Robertson, Nathaniel, Sr.; and Robertson, Nathaniel, 4,700,555, Cl. 70-203.000.
Robertson, Nathaniel, Sr.; and Robertson, Nathaniel. Anti-theft device. 4,700,555, Cl. 70-203.000.
Robertson, Philip D.; and Solorzano, Armando N., to Xanar, Inc. Smoke evacuator system for use in laser surgery. 4,701,193, Cl. 55-217.000.
Robinson, Danny C., to Leggett & Platt, Incorporated. Sofa-sleeper having a snap-in bottom-loading sofa bed mechanism. 4,700,414, Cl. 5-13.000.
Robinson, John W. Method and apparatus for controlling dryers for wood products, fabrics, paper and pulp. 4,701,857, Cl. 364-477.000.
Robson, John H.: *See*—
Soo, Hwaili; and Robson, John H., 4,701,571, Cl. 568-867.000.
Roche, Richard G.; and Blades, Russell, to Ontario, Inc. Control apparatus for ice rink refrigeration equipment. 4,700,548, Cl. 62-139.000.
Rock, Erich; and Hollenstein, Helmut, to Julius Blum Gesellschaft m.b.H. Drawer including side walls having front ends covered by cover members. 4,700,994, Cl. 312-330.00R.
Rockwell Golde GmbH: *See*—
Kollner, Harald; and Uhlig, Georg, 4,700,508, Cl. 49-352.000.
Rockwell International Corporation: *See*—
Cheung, Jeffrey T., 4,701,592, Cl. 219-121.0LT.
Elliott, Kenneth R., 4,701,422, Cl. 437-8.000.
Frankel, Milton B.; and Witucki, Edward F., 4,701,557, Cl. 564-110.000.
Rodenhurst Limited: *See*—
Albuschkat, Dieter, 4,700,565, Cl. 73-147.000.
Roderfeld, Heinrich; and Dammann, Johannes, to Claas Ohg. Self-propelled harvester thresher. 4,700,717, Cl. 130-27.00T.
Rodman, Clarke A.: *See*—
Thornton, Donald I.; and Rodman, Clarke A., 4,701,197, Cl. 55-487.000.
Rodney Hunt Company: *See*—
Henderson, Robert W., 4,700,927, Cl. 251-158.000.
Rogemont, Jean; and Nouvet, Andre, to Cefilac. Process for the manufacture of an interposed support of semipermeable membranes. 4,701,234, Cl. 156-230.000.
Rogers, Ann M.; El-Hag, Nabil A.; and Shenouda, Soliman Y. K., to General Foods Corporation. Preservation of the green color of blanched vegetables. 4,701,330, Cl. 426-270.000.
Rogers, Richard B.; and Herrero, Maria P., to Dow Chemical Company, The. Phenyl (phenoxy or phenylthio) azolomethanes. 4,701,207, Cl. 71-92.000.
Rogers, Richard B.; and Herrero, Maria P., to Dow Chemical Company, The. Pyridyl (pyridyloxy or pyriolylthio) azolomethanes. 4,701,463, Cl. 514-333.000.
Roggero, Arnaldo; and Gandini, Alberto, to Eniricerche S.p.A. Method for the termination of living polymers obtained by anionic polymerization of dienic and/or vinylaromatic monomers, and compounds suitable to that purpose. 4,701,498, Cl. 525-293.000.
Rognsvoog, Albert J., Jr. One-piece thermoformed dispensing packaging. 4,700,835, Cl. 206-411.000.
Rohde, Siegfried: *See*—
Bonitz, Jorg; Entenmann, Robert; Miller, Bernhard; Rauch, Hans; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, 4,700,677, Cl. 123-425.000.
Rohm, Gunter H. Lockable and self-tightening hammer-drill chuck. 4,700,956, Cl. 279-19.400.
Rohr, Thomas-Markus; and Kuhn, Jakob, to Ciba-Geigy AG. Polyazo dyestuffs having high UV absorption. 4,701,525, Cl. 534-678.000.
Rohrle, Josef: *See*—
Gunkel, Hans-Dieter; and Rohrle, Josef, 4,701,878, Cl. 364-900.000.
Roig, Richard R.: *See*—
Morgan, Tamara M.; Roig, Richard R.; and Hrehovcik, Michael, 4,700,850, Cl. 211-131.000.
Roley, Daniel G.: *See*—
Bernhagen, James R.; Crabb, Elmer R.; Murphy, Marilyn S.; Roley, Daniel G.; St. Germain, Gene R.; and Tunnell, James H., 4,700,794, Cl. 180-6.440.
Rollwitz, William L., to Southwest Research Institute. NMR moisture measurements. 4,701,705, Cl. 324-306.000.
Romano, Ugo: *See*—
Bellussi, Giuseppe; Buonomo, Franco; Esposito, Antonio; Clerici, Mario; Romano, Ugo; and Notari, Bruno, 4,701,428, Cl. 502-8.000.
Rommel, Reiner. Tool for crimping, cutting, pressing or the like. 4,700,592, Cl. 81-355.000.
Rorer Pharmaceutical Corporation: *See*—
Yelnosky, John; and Mir, Ghulam N., 4,701,457, Cl. 514-256.000.
Rosaen, Lars O. Automatic shut-off device. 4,700,742, Cl. 137-557.000.
Rosaen, Nils N., to Rosedale Products, Inc. Fluid filter with filter retainer. 4,701,259, Cl. 210-450.000.
Rosedale Products, Inc.: *See*—
Rosaen, Nils N., 4,701,259, Cl. 210-450.000.
Rosenberg, Philip, to Kendall Company, The. Foley catheter assembly. 4,701,162, Cl. 604-103.000.

Rosendahl, Bengt R.: *See—*
Johansson, Alf I.; and Rosendahl, Bengt R., 4,700,798, Cl. 180-209.000.
Rosendall, Henry J., to Amway Corporation. Room air treatment system. 4,701,195, Cl. 55-473.000.
Rosenquist, Niles R., to General Electric Company. Copolyester-carbonate resin containing recurring divalent units from trimellitic acid derivative. 4,701,516, Cl. 528-176.000.
Rosenquist, Niles R., to General Electric Company. Aromatic bis cyclic carbonates. 4,701,537, Cl. 549-228.000.
Rosenquist, Niles R.; and Miller, Kenneth F., to General Electric Company. Composition comprising bicyclic carbonate oligomer. 4,701,538, Cl. 549-228.000.
Rosier, Brian K.: *See—*
Hankins, Kevin T.; Michael, Mark W.; Moser, Jay D.; and Rosier, Brian K., 4,701,780, Cl. 357-51.000.
Rossi, Louis J.: *See—*
Hung, Yann; Klose, Thomas R.; Regan, Michael T.; and Rossi, Louis J., 4,701,396, Cl. 430-58.000.
Rostermundt, Karl-Heinz: *See—*
von der Eltz, Hans-Ulrich; Maier, Hans-Peter; and Rostermundt, Karl-Heinz, 4,701,182, Cl. 8-533.000.
Rosthauser, James W.: *See—*
Markusch, Peter H.; Rosthauser, James W.; and Tirpak, Robin E., 4,701,480, Cl. 523-340.000.
Roth, James A.; Canning, Peter C.; and Chiang, Yu-Wei, to Iowa State University Research Foundation, Inc. Vaccines for counteracting inhibition of neutrophil degranulation. 4,701,323, Cl. 424-88.000.
Rothmans of Pall Mall Limited: *See—*
Sheahan, Michael H., 4,700,719, Cl. 131-84.400.
Rotter, Shlomo: *See—*
El-Hanany, Uri; Lachish, Uri; Rotter, Shlomo; and Adler, Eli, 4,701,607, Cl. 250-205.000.
Rotzler GmbH & Co.: *See—*
Muller, Karl-Heinz, 4,701,099, Cl. 414-563.000.
Rourke, John K.; and O'Connor, Joseph G., to Mead Corporation, The. Method for forming images on plain paper and an imaging sheet useful therein. 4,701,397, Cl. 430-138.000.
Roussel-Uclaf: *See—*
Mendy, Francois; and Barthelemy, Pierre, 4,701,468, Cl. 514-547.000.
Mendy, Francois; and Barthelemy, Pierre, 4,701,469, Cl. 514-547.000.
Tessier, Jean; and Demoute, Jean-Pierre, 4,701,542, Cl. 549-456.000.
Torelli, Vesperto; Nedelec, Lucien; Moguilewski, Martine; and Moura, Anne-Marie, 4,701,449, Cl. 514-175.000.
Rowcycle: *See—*
Salmon, James R., 4,700,962, Cl. 280-220.000.
Rowe, Bruce: *See—*
Nelson, Deanna; and Rowe, Bruce, 4,701,443, Cl. 514-23.000.
Rowland, Stephen A., to Hymac Ltd. Two stage refiner. 4,700,900, Cl. 241-37.000.
Rowlands, Edward G.: *See—*
Barker, Martyn C.; and Rowlands, Edward G., 4,701,218, Cl. 106-114.000.
Roy, Glenn M.: *See—*
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,701,552, Cl. 562-498.000.
Rudolph, Udo: *See—*
Kauth, Hermann; Schmidt, Manfred; Freitag, Dieter; Rudolph, Udo; and Kleiner, Frank, 4,701,554, Cl. 564-14.000.
Ruehle, Guenter: *See—*
Hickmann, Udo; and Ruehle, Guenter, 4,700,820, Cl. 192-48.500.
Ruehr, Volker, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Pneumatic pressure switch for tire pressure monitor. 4,701,742, Cl. 340-58.000.
Ruf, Gerhard: *See—*
Kefer, Joseph; and Ruf, Gerhard, 4,700,645, Cl. 112-259.000.
Rugg, James M.: *See—*
Cosentino, Stephen J.; Rugg, James M.; and Mauntel, Richard W., 4,701,775, Cl. 357-23.120.
Rupprecht, Hans: *See—*
Deutschenbaur, Paul; Rupprecht, Hans; Burtscher, Norbert; and Nigg, Berno, 4,701,083, Cl. 408-240.000.
Rusnak, Mark A. Wiper element and holder. 4,700,425, Cl. 15-250.410.
Russak, Steffen P., to Sulzer Brothers Limited. Pressure medium operated servomotor arrangement. 4,700,925, Cl. 251-73.000.
Russell, V. Lee. Multiple use drain cleaning apparatus. 4,700,422, Cl. 15-104.3SN.
Rust, Jeff: *See—*
Beech, Brian; Rust, Jeff; Meilach, Alan; and LeVasseur, Rod, 4,701,600, Cl. 235-375.000.
Rutgerswerke Aktiengesellschaft: *See—*
Jellinek, Karl; Meier, Bert; and Grundke, Ulrich, 4,701,478, Cl. 522-97.000.
Rutter, Christopher C.; and Thomsen, Peter N. Double shut-off fluid dispenser element. 4,700,744, Cl. 137-614.040.
Rutterschmidt, Franz: *See—*
Reuss, Oswald; and Rutterschmidt, Franz, 4,701,740, Cl. 338-164.000.
Ryan, Edward J., to United Technologies Corporation. Multiple foil transient liquid phase bonding. 4,700,881, Cl. 228-194.000.
Ryan, Patrick B.: *See—*
Dodds, Ralph G.; and Ryan, Patrick B., 4,700,877, Cl. 228-2.000.
Ryder, Steven W.; Shand, David G.; and Mullane, John F., to American Home Products Corporation. Tolrestat as anti-hypertensive agent. 4,701,467, Cl. 514-524.000.
Rylicki, Edward J., to Industrial Electric Heating, Inc. Method and apparatus for the induction heat treatment of irregularly shaped workpieces. 4,701,584, Cl. 219-10.570.
Ryser, Hugues J.; and Shen, Wei-Chiang, to Boston University, The Trustees of. Method of effecting cellular uptake of molecules. 4,701,521, Cl. 530-322.000.
Ryu, Seung M.: *See—*
Un, Chong K.; Ryu, Seung M.; and Lee, Chong R., 4,701,905, Cl. 370-18.000.
S.A.M.M. - Societe d'Applications de Machines Motrices: *See—*
Joseph, Philippe, 4,700,970, Cl. 280-705.000.
S.A.M.M - Societe d'Applications des Machines Motrices: *See—*
Joseph, Philippe, 4,700,969, Cl. 280-705.000.
S.E.M.T., S.A.: *See—*
Baguena, Michel, 4,700,672, Cl. 123-299.000.
Sable and Matra Automobile: *See—*
Ercilla, Jose A., 4,700,989, Cl. 297-331.000.
Sackett, Robert L. Pool alarm system. 4,701,751, Cl. 340-556.000.
Sagoi, Masayuki; Tanaka, Yoichiro; and Nakamura, Hiroki, to Kabushiki Kaisha Toshiba. Magnetic recording medium. 4,701,374, Cl. 428-336.000.
Sahoda, Masayuki; Tanaka, Fuminari; and Iida, Tetsuya, to Kabushiki Kaisha Toshiba. Highspeed parallel adder with clocked switching circuits. 4,701,877, Cl. 364-784.000.
Saiji, Mitsuhiro: *See—*
Washizuka, Isamu; Nishimura, Kosuke; and Saiji, Mitsuhiro, 4,701,862, Cl. 364-513.500.
Sainsbury, Garrett M. Shaft sinking method. 4,701,073, Cl. 405-133.000.
St. Germain, Gene R.: *See—*
Bernhagen, James R.; Crabb, Elmer R.; Murphy, Marilyn S.; Roley, Daniel G.; St. Germain, Gene R.; and Tunnell, James H., 4,700,794, Cl. 180-6.440.
Saint-Gobain Vitrage: *See—*
Kraemer, Johannes; Leclere, Klemens; Nuding, Werner; and Schilde, Heinz-Josef, 4,701,240, Cl. 156-555.000.
St. Louis University: *See—*
Greenberg, Richard N., 4,701,458, Cl. 514-280.000.
Saito, Kaoru; Noji, Akio; Kakuta, Yonehiro; and Takigawa, Koichi, to Honda Giken Kogyo Kabushiki Kaisha. Cant angle sensor assembly. 4,700,479, Cl. 33-366.000.
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Akihama, Shigeyuki; Saito, Makoto; Kawamoto, Akio; Banno, Tadashi; Umeki, Yoshihiko; and Nakamura, Takumi, 4,700,518, Cl. 52-309.160.
Saito, Masayuki: *See—*
Tanaka, Takaharu; Higuchi, Naoki; Saito, Masayuki; and Hashimoto, Masaki, 4,701,210, Cl. 71-98.000.
Saito, Tadao: *See—*
Nishimura, Takumi; Saito, Tadao; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,700,991, Cl. 303-113.000.
Saito, Tokuyoshi: *See—*
Kawakatsu, Akira; Yuge, Yooji; Hayama, Noriyuki; Saito, Tokuyoshi; and Maeda, Umio, 4,701,663, Cl. 313-112.000.
Saito, Yasunori; Ichikawa, Osamu; and Oshima, Toshio, to Sumitomo Electric Industries, Ltd. Waterproof optical fiber cable and method of the production thereof. 4,701,015, Cl. 350-96.230.
Saito, Yutaka: *See—*
Mizusaki, Shigenobu; Yoshida, Daisuke; and Saito, Yutaka, 4,701,570, Cl. 568-821.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, to Canon Kabushiki Kaisha. Member having light receiving layer with nonparallel interfaces and antireflection layer. 4,701,392, Cl. 430-57.000.
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Saitoh, Masayuki: *See—*
Tanaka, Takaharu; Saitoh, Masayuki; Hashimoto, Masaki; and Higuchi, Naoki, 4,701,465, Cl. 514-423.000.
Saitou, Norio: *See—*
Okumura, Masahide; Matsuzaka, Takashi; Matsuoka, Genya; and Saitou, Norio, 4,701,620, Cl. 250-398.000.
Sakagaito, Yukuo: *See—*
Masaki, Takeshi; Kawata, Koichi; Sakagaito, Yukuo; Yamaguchi, Katsumasa; Kinoshiro, Hiromichi; and Toba, Hiroto, 4,701,591, Cl. 219-121.0LT.
Sakai, Kazuo: *See—*
Akiba, Shigeyuki; Utaka, Katsuyuki; Sakai, Kazuo; and Matsushima, Yuichi, 4,701,930, Cl. 372-96.000.
Sakai, Takao: *See—*
Fujii, Masaki; Sakai, Takao; Sakurai, Hideo; and Yamamoto, Yosiharu, 4,701,505, Cl. 526-125.000.
Sakaki, Mamoru; and Arai, Ryuichi, to Canon Kabushiki Kaisha. Light-transmissive recording medium having a crosslinked-polymer ink receiving layer. 4,701,837, Cl. 346-135.100.
Sakakibara, Shinsuke: *See—*
Kishi, Hajimu; Sakakibara, Shinsuke; and Ito, Takayuki, 4,701,686, Cl. 318-632.000.
Sakakibara, Yasuhiro; Kobayashi, Isamu; and Suzuki, Yoshinori, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Semiconductor integrated circuit device. 4,701,886, Cl. 365-189.000.

Sakakibara, Yoshio: *See—*
Yoshimura, Kazuyuki; and Sakakibara, Yoshio, 4,701,388, Cl. 430-209.000.
Sakamoto, Tsutomu: *See—*
Takashima, Shigekazu; and Sakamoto, Tsutomu, 4,701,864, Cl. 364-521.000.
Sakamoto, Yukio; Madokoro, Shinichi; and Okuyama, Shingo, to Murata Manufacturing Co., Ltd. LC filter manufacturing method. 4,700,440, Cl. 29-25.420.
Sakano, Kozaburo: *See—*
Matsuo, Junichi; Sakano, Kozaburo; and Takeda, Isamu, 4,700,871, Cl. 222-107.000.
Saksala, Pertti: *See—*
Kuusela, Juhani; Lopperi, Esko; Lummila, Markku; Saksala, Pertti; Salovaara, Esa; Suhonen, Tuomo; Perttina, Harri; Poikolainen, Esko; and Trygg, Hannu, 4,700,953, Cl. 277-38.000.
Sakuma, Toshiyuki: *See—*
Endo, Shyusuke; Aoyama, Naofumi; Yabuuchi, Toshihiko; Sakuma, Toshiyuki; and Kinugawa, Kiyoshige, 4,701,025, Cl. 350-333.000.
Sakura, Yasuhiro: *See—*
Tajima, Noriyasu; Sakura, Yasuhiro; Futakata, Takashi; Senda, Kouji; and Seki, Kazuaki, 4,700,792, Cl. 177-178.000.
Sakurai, Hideo: *See—*
Fujii, Masaki; Sakai, Takao; Sakurai, Hideo; and Yamamoto, Yosiharu, 4,701,505, Cl. 526-125.000.
Sakurai, Hiroshi, to Tokico Ltd. Magnetic disc recording and reproducing device with damper and lock for head moving motor. 4,701,823, Cl. 360-106.000.
Sakurai, Kazuhiro; and Hattori, Kyo, to Toyota Jidosha Kabushiki Kaisha. Intake device of an internal combustion engine. 4,700,669, Cl. 123-188.00M.
Sakurai, Yoshimi: *See—*
Nishikawa, Masao; Miyake, Junichi; Sakurai, Yoshimi; and Fukuda, Yukihiro, 4,700,819, Cl. 192-3.620.
Salk Institute for Biological Studies, The: *See—*
Kornreich, Wayne D.; Anderson, Harry A.; Porter, John S.; and Rivier, Jean E. F., 4,701,499, Cl. 525-333.300.
Salkin, Herve: *See—*
Grare, Didier; and Salkin, Herve, 4,700,576, Cl. 73-761.000.
Salmon, James R., to Rowcycle. Rowing type vehicle. 4,700,962, Cl. 280-220.000.
Salovaara, Esa: *See—*
Kuusela, Juhani; Lopperi, Esko; Lummila, Markku; Saksala, Pertti; Salovaara, Esa; Suhonen, Tuomo; Perttina, Harri; Poikolainen, Esko; and Trygg, Hannu, 4,700,953, Cl. 277-38.000.
Salsman, Robert W., Jr.: *See—*
Callegari, Stephen R., Sr.; Harrison, Luther A.; and Salsman, Robert W., Jr., 4,701,869, Cl. 364-562.000.
Salter, Stephen J.: *See—*
Thach, Sophany; Salter, Stephen J.; Meyers, Kevin O.; and Giordano, Ronald M., 4,701,271, Cl. 252-8.554.
Samuelson, John P.; and Quast, Douglas A., to University of Minnesota, Regents of the. Walker for a small child. 4,700,730, Cl. 135-67.000.
Samulak, Douglas J., to Cummins Engine Company, Inc. Auxiliary heater controller. 4,700,888, Cl. 237-2.00A.
Sanden Corporation: *See—*
Daikohara, Tamotsu, 4,701,109, Cl. 417-223.000.
Shimizu, Shigemi; and Iizuka, Jiro, 4,701,115, Cl. 418-55.000.
Sanders Associates, Inc.: *See—*
Apostolos, John T., 4,701,762, Cl. 342-417.000.
Thomas, Michael D., 4,701,924, Cl. 372-19.000.
Sandoz Ltd.: *See—*
Kaspers, Helmut; Duben, Jiri; and Gisi, Ulrich, 4,701,454, Cl. 514-245.000.
Sankhagowit, Thanomsak, to National Semiconductor Corporation. Pre-testable semiconductor die package. 4,701,781, Cl. 357-70.000.
Sano, Yumiko: *See—*
Morimoto, Teruyo; Sano, Yumiko; Nimura, Eiji; Tomii, Yuji; and Maeda, Tatsuo, 4,701,389, Cl. 430-110.000.
Sanshin Kogyo Kabushiki Kaisha: *See—*
Matsushita, Yukio, 4,700,671, Cl. 123-198.00C.
Sumigawa, Yukio, 4,701,141, Cl. 440-55.000.
Uehara, Hidehiko, 4,701,151, Cl. 464-89.000.
Santa Barbara Research Center: *See—*
Kern, Mark T.; Hodges, Steven E.; Snider, Danny G.; and Shamordola, Kenneth A., 4,701,624, Cl. 250-554.000.
Santala, Timo J.: *See—*
Jost, Ernest M.; and Santala, Timo J., 4,700,475, Cl. 29-874.000.
Santilli, Domenic: *See—*
Alexandrovich, Peter S.; Santilli, Domenic; and Ng, Yee S., 4,701,387, Cl. 430-45.000.
Santo, Philip J. Floatation sleep system including a rectilinear perimeter air chamber. 4,700,419, Cl. 5-452.000.
Sanyo Electric Co., Ltd.: *See—*
Fukasawa, Minoru, 4,701,588, Cl. 219-10.770.
Imai, Nobuo, 4,701,901, Cl. 369-75.200.
Kikkawa, Yoshiro, 4,701,683, Cl. 318-254.000.
Sapoff, Paul C., to Catalyst Technology, Inc. Modular multi-tube catalyst loading funnel. 4,701,101, Cl. 414-786.000.
Sarich, Nancy J.: *See—*
Frost, John R.; Sarich, Nancy J.; Schenz, Timothy W.; and Glatz, Alfred C., 4,701,337, Cl. 426-548.000.
Sarin, Vinod K.; and Hintermann, Hans E., to GTE Laboratories Incorporated. Composite coatings on cemented carbide substrates. 4,701,384, Cl. 428-688.000.
Sarl Logilift: *See—*
Evin, Jean, 4,700,811, Cl. 187-116.000.
Sasaki, Hiroyuki: *See—*
Morikawa, Shigenori; and Sasaki, Hiroyuki, 4,700,604, Cl. 84-1.030.
Sasaki, Kazuko, to Figaro Engineering Inc. Exhaust gas sensor and process for producing same. 4,701,739, Cl. 338-34.000.
Sasaki, Masahiro: *See—*
Fujii, Tadashi; Yagami, Hiroyuki; Seo, Iwao; and Sasaki, Masahiro, 4,701,659, Cl. 310-334.000.
Sasaki, Mitsuru; and Oguri, Yukio, to Sumitomo Chemical Company, Limited. Aluminum phosphinate-amine adducts, and their production and use. 4,701,209, Cl. 71-97.000.
Sasaki, Shingo, to NGK Insulators, Ltd. Radial-type ceramic turbine rotor and a method for producing the same. 4,701,106, Cl. 416-241.00B.
Sasaki, Takayuki; and Arai, Masaaki, to Sony Corporation. Signal generator using digital memory. 4,701,871, Cl. 364-718.000.
Satake Engineering Co., Ltd.: *See—*
Satake, Toshihiko, 4,700,622, Cl. 100-45.000.
Satake, Toshihiko, to Satake Engineering Co., Ltd. Apparatus for compressing and solidifying fibrous materials of plants. 4,700,622, Cl. 100-45.000.
Sato, Kazuhiko; Nakamura, Genshiro; and Itagaki, Takushi, to Mitsubishi Denki Kabushiki Kaisha. Amorphous solar cell. 4,701,572, Cl. 136-258.000.
Sato, Norio, to Toshiba Silicone Company, Ltd. Curable polyorganosiloxane composition. 4,701,503, Cl. 525-478.000.
Sato, Susumu; and Arashida, Toshio, to NCR Corporation. Automatic document page turning apparatus. 4,700,497, Cl. 40-531.000.
Sato, Takashi: *See—*
Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, 4,701,902, Cl. 369-77.100.
Sato, Takuro: *See—*
Fukasawa, Atsushi; Sato, Takuro; Akiyama, Haruhiko; and Kawabe, Manabu, 4,701,923, Cl. 371-41.000.
Sato, Youji: *See—*
Hirano, Seiji; and Sato, Youji, 4,700,913, Cl. 248-73.000.
Sato, Yukio, to Canon Kabushiki Kaisha. Image data compression apparatus. 4,701,803, Cl. 358-260.000.
Sato, Yuzuru: *See—*
Yazaki, Minoru; and Sato, Yuzuru, 4,701,026, Cl. 350-333.000.
Satomura, Masato; Iwakura, Ken; and Kawakami, Hiroshi, to Fuji Photo Film Co., Ltd. Process for preparation of ethers. 4,701,565, Cl. 568-644.000.
Satou, Kazuhiro; Kudo, Koji; Maruyama, Masanori; Mimura, Itaru; and Nagahara, Shusaku, to Hitachi, Ltd. Method of and apparatus for controlling amount of electron beam in image pickup tube. 4,701,679, Cl. 315-383.000.
Sauer, Rudolf: *See—*
Hans, Waldemar; Kind, Wilhelm; Knapp, Heinrich; Kramer, Wolfgang; and Sauer, Rudolf, 4,700,891, Cl. 239-132.500.
Saum, Jack. Fireplace ashes removal device. 4,700,978, Cl. 294-9.000.
Saunders, Charles A., IV. Connector assembly for windscreen accessories. 4,700,919, Cl. 248-288.500.
Savord, Bernard J., to Hewlett-Packard Company. Method to improve accuracy in delay lines. 4,700,573, Cl. 73-625.000.
SavR Company, Inc.: *See—*
Cain, Jerry T.; Mason, James M.; and Rainey, Tommy D., 4,701,087, Cl. 410-94.000.
Sawaki, Akira: *See—*
Horiuchi, Tatsumi; Kasahara, Seitaro; and Sawaki, Akira, 4,701,044, Cl. 355-7.000.
Sawamoto, Hirokazu: *See—*
Kayane, Yutaka; Sawamoto, Hirokazu; Omura, Takashi; Harada, Naoki; and Takeshita, Akira, 4,701,524, Cl. 534-642.000.
Scampini, Daniel. Variable volume ejector with motive fluid pulser. 4,701,108, Cl. 417-104.000.
Scanlon, John M., to Vulcan-Hart Corporation. Removable cooking surface for the movable platen of a two-sided cooking device. 4,700,619, Cl. 99-349.000.
Scantherm A/S: *See—*
Evensen, Cato, 4,701,933, Cl. 373-117.000.
Scarano, Robert V.; and Hudon, James D., to Albany International Corp. Mechanism for moving a shower nozzle in a paper making machine. 4,701,242, Cl. 162-275.000.
Scarr, Robert W. A., to Standard Telephones and Cables Public Limited Co. Associative memory systems. 4,701,879, Cl. 365-49.000.
Schack, Warren R.: *See—*
Powers, Richard G.; Schack, Warren R.; Alley, Lewis F.; and Anderson, James E., 4,700,899, Cl. 241-30.000.
Schade, Harvey R. Oil filter adapter providing parallel loop flow paths. 4,700,670, Cl. 123-196.00A.
Schaefer, Robert D.; and Kiunke, Paul C., to Hughes Aircraft Company. Adaptable modular stabilization system. 4,701,602, Cl. 250-201.000.
Schafer, Bruce W.: *See—*
Fasnacht, Floyd A., Jr.; Klahn, Frank C.; Schafer, Bruce W.; and Werner, Charles E., 4,700,662, Cl. 122-392.000.
Schalk, Bart, to SKF Industrial Trading and Development Company B.V. Method for the assembly of an inner race for a roller bearing and an annular cage whose openings contain rolling elements. 4,700,443, Cl. 29-148.40C.

Schanze, Klaus: *See—*
Schuck, Helmut; Foerster, Karl-Heinz; Kuehn, Monika; and Schanze, Klaus, 4,701,757, Cl. 340-825.060.
Scheffers, Alexander: *See—*
van Dijken, Johannes; and Scheffers, Alexander, 4,701,414, Cl. 435-163.000.
Schenk, Heinrich, to Siemens Aktiengesellschaft. Method and a circuit arrangement for digital signal processing utilizing adaptive transversal filter techniques. 4,701,873, Cl. 364-724.000.
Schenz, Timothy W.: *See—*
Frost, John R.; Sarich, Nancy J.; Schenz, Timothy W.; and Glatz, Alfred C., 4,701,337, Cl. 426-548.000.
Schering Aktiengesellschaft: *See—*
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Toepert, Michael; and Wendt, Hans, 4,701,451, Cl. 514-180.000.
Franke, Heinrich; Joppien, Hartmut; and Franke, Helga, 4,701,563, Cl. 568-639.000.
Schering Corporation: *See—*
Vashi, Dhiru B.; Clark, Jeffrey N.; and Lindo, Neil A., 4,701,447, Cl. 514-85.000.
Schierling, Roland; Geyer, Werner; Wissmann, Michael; and Nickel, Hans, to Andreas Stihl. Method of injecting fuel for two-stroke engine and apparatus therefor. 4,700,668, Cl. 123-73.00C.
Schilde, Heinz-Josef: *See—*
Kraemer, Johannes; Leclere, Klemens; Nuding, Werner; and Schilde, Heinz-Josef, 4,701,240, Cl. 156-555.000.
Schipper, Lambert A.: *See—*
Kreuwel, Johannes G.; and Schipper, Lambert A., 4,701,191, Cl. 55-198.000.
Schirmer, Guenter; and Woelffing-Seelig, Gerhard, to Robert Bosch GmbH. Device for supervising condition of electric consumers in a motor vehicle. 4,701,596, Cl. 219-483.000.
Schlecht, Klaus: *See—*
Margolis, Geoffrey; Mercier, Alain; and Schlecht, Klaus, 4,701,333, Cl. 426-432.000.
Schleicher, John K.; and James, James R., Sr., to Accuratio Systems, Inc. Movable fluid dispenser with air bubble detectors for controlling dispenser movement. 4,700,870, Cl. 222-63.000.
Schlesier, Kenneth M., to RCA Corporation. Method of making a resistor. 4,701,241, Cl. 156-643.000.
Schley, Roy A.: *See—*
Andrews, Edward W.; and Schley, Roy A., 4,701,795, Cl. 358-150.000.
Schlumberger Technology Corporation: *See—*
Ohmer, Herve; and Delpuech, Alain G. M., 4,701,890, Cl. 367-25.000.
Schmid, Anton; Tauschek, Georg; Sedlmeier, Andreas; and Pollok, Peter, to Bayerisches Leichtmetallwerk Graf Blucher von Wahlstatt GmbH. Forging process. 4,700,446, Cl. 29-159.200.
Schmid, Johann J., to Willi Studer AG. Method for determining the starting point and the end point of closed spatial signal patterns. 4,700,712, Cl. 128-699.000.
Schmider, Fritz, to Papst-Motoren GmbH & Co KG. D.C. machine, with mechanical and electrical connections among collector segments. 4,701,655, Cl. 310-237.000.
Schmidt, Adolf: *See—*
Hendricks, Udo W.; and Schmidt, Adolf, 4,701,284, Cl. 260-513.00N.
Schmidt, Manfred: *See—*
Kauth, Hermann; Schmidt, Manfred; Freitag, Dieter; Rudolph, Udo; and Kleiner, Frank, 4,701,554, Cl. 564-14.000.
Schmitt, Walter, to Johannes Heidenhain GmbH. Measuring scale coding system for length or angle measuring instruments. 4,701,615, Cl. 250-237.00G.
Schmitz, Herman J. R.: *See—*
Froling, Melchert H.; and Schmitz, Herman J. R., 4,701,794, Cl. 358-147.000.
Schmutz, Bernard P., to Giovanola Freres SA; and Intamin AG. Device to retain roller coaster passengers in standing position. 4,700,632, Cl. 104-63.000.
Schneider, Michel: *See—*
de Lassat de Pressigny, Yann; and Schneider, Michel, 4,700,930, Cl. 266-267.000.
Schneider, Wilhelm, to Hermann Heye. Cooling arrangement for a glass forming apparatus. 4,701,203, Cl. 65-265.000.
Schnitz, Guenter: *See—*
Langlitz, Karlheinz; and Schnitz, Guenter, 4,700,929, Cl. 266-246.000.
Schoen, Oscar W., Jr. Dew point hygrometer. 4,701,052, Cl. 356-369.000.
Schoening, Josef; Wachholz, Winfried; and Weicht, Ulrich, to Hochtemperatur-Reaktorbau GmbH. Low capacity nuclear reactor placed underground in the cavity of a cylindrical pressure vessel. 4,701,298, Cl. 376-273.000.
Schoffstall, Charles D. Method and apparatus for applying traction. 4,700,696, Cl. 128-71.000.
Scholes, Gary: *See—*
Mason, Ronald F.; Scholes, Gary; and van Reijendam, Jan W., 4,701,534, Cl. 548-950.000.
Schora, Frank C.: *See—*
Janka, John C.; Schora, Frank C.; and Knowlton, Ted M., 4,701,266, Cl. 210-803.000.
Schorlemmer, Hans-Ulrich: *See—*
Limbert, Michael; Durckheimer, Walter; Schorlemmer, Hans-Ulrich; and Dickneite, Gerhard, 4,701,452, Cl. 514-206.000.
Schotz, Udo. Apparatus for changing the mast of a sailboard. 4,700,649, Cl. 114-90.000.
Schroder, Joris, to Inventio AG. Apparatus for mounting printed circuit boards on an instrument rack. 4,700,846, Cl. 211-41.000.
Schroll, Ross E.: *See—*
Harrigan, Michael E.; Durbin, John A.; and Schroll, Ross E., 4,701,027, Cl. 350-334.000.
Schubert & Salzer: *See—*
Artzt, Peter; Muller, Heinz; Ziegler, Kurt; Egbers, Gerhard; and Wokaun, Jacek, 4,700,431, Cl. 19-105.000.
Handschuch, Karl, 4,700,539, Cl. 57-401.000.
Schuck, Helmut; Foerster, Karl-Heinz; Kuehn, Monika; and Schanze, Klaus, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Control system for printing machines. 4,701,757, Cl. 340-825.060.
Schuetz, Alfred; Muller, Wolfgang; and Soutschek, Ewald, to Siemens Aktiengesellschaft. Integrated circuit for the emission of a voltage which alternates between positive and negative voltage levels. 4,701,634, Cl. 307-269.000.
Schulten, Gerd-Hermann: *See—*
Brunn, Horst; Schulten, Gerd-Hermann; and Fuhr, Werner, 4,701,221, Cl. 106-304.000.
Schulz, Daniel R.: *See—*
Barrett, John P.; Schulz, Daniel R.; Kent, David E.; deFasselle, Robert J.; and Zega, Henry E., 4,700,884, Cl. 236-12.120.
Schwartz, Stephan: *See—*
Carlsson, H. Roger; Schwartz, Stephan; and Hallberg, Mats, 4,701,265, Cl. 210-744.000.
Schwarz, Alexander: *See—*
Bennett, Douglas L.; Ludwig, Keith A.; and Schwarz, Alexander, 4,700,771, Cl. 165-1.000.
Schwarz, Gebhard, to Sueddeutsche Kuehlerfabrik Julius F. Behr. GmbH. Oil cooler. 4,700,774, Cl. 165-140.000.
Scott & Fetzer Company, The: *See—*
Tallman, William R.; and Kaplan, Robert A., 4,701,123, Cl. 431-171.000.
Scott, Warner C., to Texas Instruments Incorporated. Signature verification. 4,701,960, Cl. 382-3.000.
Scully, Michael J.: *See—*
Good, Robert S.; Scully, Michael J.; and Zelko, William E., 4,701,139, Cl. 439-497.000.
Searcy, James A.; Zoellner, Roger O.; and Hoffmann, Ronald C., to Cambridge Engineering, Inc. Ventilating hood. 4,700,688, Cl. 126-299.00D.
Sedlmeier, Andreas: *See—*
Schmid, Anton; Tauschek, Georg; Sedlmeier, Andreas; and Pollok, Peter, 4,700,446, Cl. 29-159.200.
Seeley, Robert L.; Barth, Joseph J.; and Clayton, Gerald H., II, to United States of America, Interior. Thermoregulated magnetic susceptibility sensor assembly. 4,701,712, Cl. 324-340.000.
Seeq Technology, Inc.: *See—*
Perlegos, Gust; and Wu, Tsung-Ching, 4,701,776, Cl. 357-23.500.
Segal, Ester; and Lehrer, Nurit. Topical pharmaceutical preparations containing chitin soluble extract. 4,701,444, Cl. 514-55.000.
Segal, Marcos; and Kunze, Michael. Water-soluble disazo compounds containing one or two (nitro-phenylamino)-phenylamino-chloro-triazinylamino groups, the nitro-phenylamino being additionally substituted by a fiber-reactive group of the vinylsulfone series, suitable as dyestuffs. 4,701,523, Cl. 534-634.000.
Seidel, Raymond L.; and Viola, Marian, to Automatic Roller Doors Australia Pty. Ltd. Door or gate obstruction control. 4,701,684, Cl. 318-282.000.
Seidl, Gunther, to Zahnradfabrik Friedrichshafen, AG. Regulation of vane pumps. 4,701,111, Cl. 417-300.000.
Seiko Epson Kabushiki Kaisha: *See—*
Yazaki, Minoru; and Sato, Yuzuru, 4,701,026, Cl. 350-333.000.
Seiko Instruments & Electronics Ltd.: *See—*
Nagai, Masahide; Noda, Minoru; and Suzuki, Hitoshi, 4,701,100, Cl. 414-751.000.
Seiwa, Yoshito; and Takamiya, Saburo, to Mitsubishi Denki Kabushiki Kaisha. Laser diode. 4,701,926, Cl. 372-45.000.
Seki, Kazuaki: *See—*
Tajima, Noriyasu; Sakura, Yasuhiro; Futakata, Takashi; Senda, Kouji; and Seki, Kazuaki, 4,700,792, Cl. 177-178.000.
Sekiya, Mutsuo: *See—*
Tanaka, Hideharu; Sekiya, Mutsuo; and Uchikawa, Fusaoki, 4,700,805, Cl. 181-265.000.
Sekiya, Tetsuo: *See—*
Yada, Hiroaki; Imakoshi, Shigeyoshi; Suyama, Hideo; Sekiya, Tetsuo; and Nakayama, Masayuki, 4,701,815, Cl. 360-77.000.
Seko, Ichiro: *See—*
Naka, Hiroshi; Seko, Ichiro; Kobayashi, Shuji; and Haneda, Makoto, 4,701,927, Cl. 372-46.000.
Selfridge, Glenn D.: *See—*
Dutton, Edmund L.; Selfridge, Glenn D.; and Tipton, Russell C., 4,701,415, Cl. 435-289.000.
Senba, Takashi; and Tachikawa, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Automatic ultrasonic flaw detecting system. 4,700,572, Cl. 73-622.000.
Senda, Kouji: *See—*
Tajima, Noriyasu; Sakura, Yasuhiro; Futakata, Takashi; Senda, Kouji; and Seki, Kazuaki, 4,700,792, Cl. 177-178.000.
Senf, John W.: *See—*
Eisenhut, Wolfgang O.; and Senf, John W., 4,701,112, Cl. 417-345.000.

Seng, Hans-Peter, to Zeller+Gmelin GmbH & Co. One-component formulation for precipitating, detackifying and coagulating underseal. 4,701,220, Cl. 106-203.000.
Senkbeil, Herman O.: *See*—
Dunbar, Joseph E.; Holmsen, Theodore W.; and Senkbeil, Herman O., 4,701,211, Cl. 71-121.000.
Sentron v.o.f.: *See*—
Ligtenberg, Hendrikus C. G.; and Leuveld, Jozef G. M., 4,701,253, Cl. 204-416.000.
Seo, Iwao: *See*—
Fujii, Tadashi; Yagami, Hiroyuki; Seo, Iwao; and Sasaki, Masahiro, 4,701,659, Cl. 310-334.000.
Serikawa, Yoshio, to Ricoh Company, Ltd. Flash photographing system. 4,701,041, Cl. 354-413.000.
Serizawa, Hajime; Ogihara, Keizo; Shimizu, Kiyoshi; and Harada, Susumu, to Nitto Boseki Co., Limited. Process for producing novel photosensitive resins. 4,701,497, Cl. 525-292.000.
Seyler, Peter G., to Perfection Spring & Stamping Corp. Paint drain closure and vehicle panel. 4,700,981, Cl. 296-1.00F.
SGS Microelettronica S.p.A.: *See*—
Marchio , Fabio; and Menniti, Pietro, 4,701,638, Cl. 307-300.000.
SGS Microelettronica SpA: *See*—
Chieli, Davide, 4,701,631, Cl. 307-254.000.
Shalaby, Shalaby W.: *See*—
Jamiolkowski, Dennis D.; and Shalaby, Shalaby W., 4,700,704, Cl. 128-335.500.
Shamordola, Kenneth A.: *See*—
Kern, Mark T.; Hodges, Steven E.; Snider, Danny G.; and Shamordola, Kenneth A., 4,701,624, Cl. 250-554.000.
Shand, David G.: *See*—
Ryder, Steven W.; Shand, David G.; and Mullane, John F., 4,701,467, Cl. 514-524.000.
Sharp Kabushiki Kaisha: *See*—
Nishimura, Toshio, 4,701,693, Cl. 323-303.000.
Washizuka, Isamu; Nishimura, Kosuke; and Saiji, Mitsuhiro, 4,701,862, Cl. 364-513.500.
Yoshimura, Masahiro, 4,701,799, Cl. 358-241.000.
Sharpoint L.P.: *See*—
Smith, Andrea, 4,700,833, Cl. 206-380.000.
Shaw, Graham: *See*—
De Mol, Dirk; and Shaw, Graham, 4,700,557, Cl. 72-12.000.
Sheahan, Michael H., to Rothmans of Pall Mall Limited. Control of cigarette rod formation. 4,700,719, Cl. 131-84.400.
Sheen, Guang-Yue. Faucet valve. 4,700,736, Cl. 137-315.000.
Shell Oil Company: *See*—
Boxhoorn, Gosse; Klazinga, Aan H.; and Velthuis, Otto M., 4,701,437, Cl. 502-348.000.
Eckstein, Gunter K., 4,701,185, Cl. 48-197.00R.
Graafland, Teunis, 4,701,494, Cl. 524-811.000.
Langner, Carl G., 4,700,788, Cl. 175-61.000.
Maas, Lawrence W.; Geiman, Richard A.; and Adams, Charles T., 4,701,254, Cl. 208-26.000.
Mason, Ronald F.; Scholes, Gary; and van Reijendam, Jan W., 4,701,534, Cl. 548-950.000.
Tripp, Harley A., 4,700,577, Cl. 73-801.000.
Shemeta, Paul J.; and Hendricks, Daniel A., to Boeing Company, The. Device for orienting and conveying a headed fastener. 4,700,471, Cl. 29-809.000.
Shen, Wei-Chiang: *See*—
Ryser, Hugues J.; and Shen, Wei-Chiang, 4,701,521, Cl. 530-322.000.
Shenouda, Soliman Y. K.: *See*—
Rogers, Ann M.; El-Hag, Nabil A.; and Shenouda, Soliman Y. K., 4,701,330, Cl. 426-270.000.
Shiba, Masataka: *See*—
Oshida, Yoshitada; Shiba, Masataka; Nakashima, Naoto; Nakata, Toshihiko; and Uto, Sachio, 4,701,050, Cl. 356-152.000.
Shieh, Song-Huei. Retractile umbrella cover and knockdown umbrella stand. 4,700,847, Cl. 211-62.000.
Shiga, Koji. Method of photographing on microfilm and apparatus therefor. 4,701,046, Cl. 355-39.000.
Shiiki, Zenya: *See*—
Katto, Takayuki; Komatsu, Yasumasa; and Shiiki, Zenya, 4,701,495, Cl. 525-75.000.
Shill, David, to Thermoguard Equipment Inc. Corrugated sheet unstacking and feeding apparatus. 4,700,941, Cl. 271-151.000.
Shimada, Kizashi; Akiyama, Tatsuo; and Koshino, Yutaka, to Kabushiki Kaisha Toshiba. Method of fabricating Schottky gate-type GaAs field effect transistor. 4,700,455, Cl. 437-39.000.
Shimamura, Masaharu: *See*—
Yoshikawa, Seiichi; Yoshioka, Toshio; and Shimamura, Masaharu, 4,700,723, Cl. 131-334.000.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,700,588, Cl. 74-594.400.
Shimbo, Masaru: *See*—
Nakagawa, Akio; Ohashi, Hiromichi; Ogura, Tsuneo; and Shimbo, Masaru, 4,700,466, Cl. 437-247.000.
Shimirak, Gerlad L.; Hunter, Thomas; Story, Martha F.; Halstead, W. G.; Chan, Paul S.; and Swinmurn, Christopher J., to Raychem Corp. Cable sealing apparatus. 4,701,574, Cl. 174-93.000.
Shimiya, Keiji: *See*—
Koizumi, Yuichiro; Nojima, Masaki; and Shimiya, Keiji, 4,701,622, Cl. 250-486.100.
Shimizu, Hiromitsu: *See*—
Hirose, Tokuzo; and Shimizu, Hiromitsu, 4,700,643, Cl. 112-231.000.
Shimizu, Hisashi: *See*—
Itoh, Kunio; Shiobara, Toshio; Futatsumori, Koji; Tomiyoshi, Kazutoshi; and Shimizu, Hisashi, 4,701,482, Cl. 523-435.000.
Shimizu, Isamu: *See*—
Inoue, Eiichi; Shimizu, Isamu; and Komatsu, Toshiyuki, 4,701,394, Cl. 430-57.000.
Shimizu, Kiyoshi: *See*—
Serizawa, Hajime; Ogihara, Keizo; Shimizu, Kiyoshi; and Harada, Susumu, 4,701,497, Cl. 525-292.000.
Shimizu, Shigemi; and Iizuka, Jiro, to Sanden Corporation. Axial sealing mechanism for a scroll compressor. 4,701,115, Cl. 418-55.000.
Shimizu, Yukihiko: *See*—
Watanabe, Hiroshi; and Shimizu, Yukihiko, 4,701,670, Cl. 315-169.300.
Shimogai, Kiyoshi: *See*—
Hashimoto, Hitoshi; Tamaki, Yoshihiro; Mikami, Kazufumi; and Shimogai, Kiyoshi, 4,701,081, Cl. 408-1.00R.
Shimohigashi, Katsuhiro: *See*—
Aoki, Masakazu; Horiguchi, Masashi; Nakagome, Yoshinobu; Ikenaga, Shinichi; Shimohigashi, Katsuhiro; Masuhara, Toshiaki; Itoh, Kiyoo; Nakamura, Hideo; and Minato, Osamu, 4,701,884, Cl. 365-189.000.
Shimura, Shinya: *See*—
Iijima, Toshifumi; Yamada, Yoshitaka; Kumashiro, Kenji; Kamio, Takashi; and Shimura, Shinya, 4,701,404, Cl. 430-559.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Itoh, Kunio; Shiobara, Toshio; Futatsumori, Koji; Tomiyoshi, Kazutoshi; and Shimizu, Hisashi, 4,701,482, Cl. 523-435.000.
Mori, Shigeru; and Takahashi, Takayuki, 4,701,272, Cl. 252-28.000.
Shiobara, Toshio; and Tomiyoshi, Kazutoshi, 4,701,479, Cl. 523-220.000.
Shin-Etsu Polymer Co., Ltd.: *See*—
Kawaguchi, Toshiyuki; Suzuki, Hideki; and Usuda, Tsuneo, 4,701,279, Cl. 252-511.000.
Shinohara Machinery Co., Ltd.: *See*—
Iwamoto, Masayuki; Araki, Setsuo; and Sone, Yasuo, 4,700,626, Cl. 101-230.000.
Shiobara, Toshio; and Tomiyoshi, Kazutoshi, to Shin-Etsu Chemical Co., Ltd. Epoxy resin-based composition for encapsulation of semiconductor devices. 4,701,479, Cl. 523-220.000.
Shiobara, Toshio: *See*—
Itoh, Kunio; Shiobara, Toshio; Futatsumori, Koji; Tomiyoshi, Kazutoshi; and Shimizu, Hisashi, 4,701,482, Cl. 523-435.000.
Shiraishi, Daiichi: *See*—
Kinaga, Eiichi; and Shiraishi, Daiichi, 4,700,983, Cl. 296-146.000.
Kinaga, Eiichi; and Shiraishi, Daiichi, 4,700,984, Cl. 296-146.000.
Shirley, David, to NL Petroleum Products Limited. Rotary drill bits. 4,700,790, Cl. 175-410.000.
Shishido, Yoshio, to Olympus Optical Co., Ltd. Endoscope means and ovum picker employed by inserting through endoscope means. 4,700,694, Cl. 128-6.000.
Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See*—
Kaneko, Junya, 4,700,611, Cl. 91-405.000.
Shreve, Gary A.: *See*—
Henderson, Richard S.; Shreve, Gary A.; and Tenhover, Michael A., 4,701,226, Cl. 148-403.000.
Shulcon Industries, Inc.: *See*—
Shull, James J., 4,701,445, Cl. 514-57.000.
Shull, James J., to Shulcon Industries, Inc. Easily dispersible agglomerated hygroscopic compositions. 4,701,445, Cl. 514-57.000.
Shumaker, Fred E.: *See*—
Key, Joe W.; and Shumaker, Fred E., 4,701,143, Cl. 441-5.000.
Shurboff, John: *See*—
Freyman, Bruce J.; Dorinski, Dale; and Shurboff, John, 4,700,473, Cl. 29-846.000.
Sibata, Takuo: *See*—
Kuroiwa, Yosio; and Sibata, Takuo, 4,701,085, Cl. 409-244.000.
Sibley, Lincoln L., Jr.: *See*—
Pettinga, Robert; Dix, Joseph; McHugh, Thomas O.; Sibley, Lincoln L., Jr.; Ziemba, Richard T.; and Forrester, Victor J., 4,700,608, Cl. 89-11.000.
Siegfried, Robert W., II: *See*—
Castagna, John P.; and Siegfried, Robert W., II, 4,701,891, Cl. 367-31.000.
Siemens Aktiengesellschaft: *See*—
Birkle, Siegfried; and Gehring, Johann, 4,701,248, Cl. 204-201.000.
Freisen, Ludger; Kess, Helmut; Krause, Norbert; and Meissner, Ralph, 4,701,710, Cl. 324-318.000.
Grassl, Hans-Peter, 4,701,657, Cl. 310-313.00C.
Gunkel, Hans-Dieter; and Rohrle, Josef, 4,701,878, Cl. 364-900.000.
Riedl, Hermann, 4,701,707, Cl. 324-309.000.
Schenk, Heinrich, 4,701,873, Cl. 364-724.000.
Schuetz, Alfred; Muller, Wolfgang; and Soutschek, Ewald, 4,701,634, Cl. 307-269.000.
Stader, Harald, 4,701,947, Cl. 379-124.000.
Sikora, Scott T., to Tomar Electronics, Inc. Strobe flash monitor. 4,701,672, Cl. 315-241.00S.
Silicon Valley Group, Inc.: *See*—
Soares, Paul, 4,700,595, Cl. 82-40.00R.
Silva, James M., to General Electric Company. Method for making reaction products of phosgene and dihydric phenol. 4,701,544, Cl. 558-281.000.
Simon, Francois. Device of the clevis type for handling operations. 4,700,433, Cl. 24-68.00B.
Simon, Gary J., to Velo Bind Inc. Punch pin head structure. 4,700,601, Cl. 83-687.000.

Simon, Hans-Dieter: *See*—
Strate, Hans; and Simon, Hans-Dieter, 4,700,453, Cl. 29-568.000.
Simpson, Harold S., to Harold Simpson, Inc. Standing seam sidelap system and method for assembling same. 4,700,522, Cl. 52-528.000.
Singer Company, The: *See*—
Barrett, Michael E., 4,700,481, Cl. 30-475.000.
Sinisalo Sport OY: *See*—
Mattila, Heikki, 4,700,407, Cl. 2-23.000.
Sircar, Ila; and Bristol, James A., to Warner-Lambert Company. Substituted indeno-pyridazinones. 4,701,453, Cl. 514-222.000.
Sirkin, Eric R., to Zoran Corporation. Method of selectively making contact structures both with barrier metal and without barrier metal in a single process flow. 4,700,465, Cl. 437-20.000.
Siu, Byron B.: *See*—
Baerg, William; Ting, Chiu H.; Siu, Byron B.; and Tzeng, J. C., 4,700,454, Cl. 437-24.000.
SKF Industrial Trading and Development Company B.V.: *See*—
Schalk, Bart, 4,700,443, Cl. 29-148.40C.
SKF-Textilmaschinen-Komponensten GmbH: *See*—
Braun, Ernst, 4,701,652, Cl. 310-112.000.
Skiles, David O.: *See*—
Ramachandran, Sundaresan; Skiles, David O.; and Hansen, Donald J., 4,701,309, Cl. 423-20.000.
Skostins, Olgerts: *See*—
Lamont, Peter; Monroe, Carl M.; and Skostins, Olgerts, 4,701,491, Cl. 524-493.000.
Slade, James R., Jr.: *See*—
Sterba, Richard F.; and Slade, James R., Jr., 4,700,944, Cl. 272-117.000.
Slappey, L. Marvin, Jr. Field stripping key punch. 4,700,500, Cl. 42-90.000.
Sleffel, William M., to Kerr-McGee Corporation. Pulse accumulator network adapted for use in a flow monitoring system. 4,700,568, Cl. 73-195.000.
SLM Corporation: *See*—
Vajtay, Laselo, deceased, 4,700,883, Cl. 229-125.170.
Smith, Alvin D.; Smith, Darin E.; and Smith, Reed R. Long reach dropped wheel-line irrigation system. 4,700,897, Cl. 239-741.000.
Smith, Andrea, to Sharpoint L.P. Suture winding card. 4,700,833, Cl. 206-380.000.
Smith, Darin E.: *See*—
Smith, Alvin D.; Smith, Darin E.; and Smith, Reed R., 4,700,897, Cl. 239-741.000.
Smith, Edgar D., to Jerone Technologies, Inc. Method of manufacture of a can end with a push in vent tab and main tab. 4,701,090, Cl. 413-13.000.
Smith, Gary K.: *See*—
Nichol, Charles A.; Reinhard, John F., Jr.; Smith, Gary K.; and Bigham, Eric C., 4,701,455, Cl. 514-249.000.
Smith International, Inc.: *See*—
Flohr, Mark C., 4,700,739, Cl. 137-488.000.
Smith, Kenneth W. Mobile unit for facilitating wood frame construction. 4,700,513, Cl. 52-69.000.
Smith, Lawrence M.: *See*—
Braun, Alan J.; Smith, Lawrence M.; and Wildman, Kelvin H., 4,701,597, Cl. 219-521.000.
Smith, Michael K. Foldable shade structure. 4,700,731, Cl. 135-117.000.
Smith, Michael L.; and Hensley, Donald E., to Halliburton Company. Wet connector for use with drill pipe conveyed logging apparatus. 4,700,778, Cl. 166-250.000.
Smith, Randall C. Dual mode music instrument preamplifier. 4,701,957, Cl. 381-61.000.
Smith, Raymond J.: *See*—
Nelson, John E.; and Smith, Raymond J., 4,700,924, Cl. 251-58.000.
Smith, Reed R.: *See*—
Smith, Alvin D.; Smith, Darin E.; and Smith, Reed R., 4,700,897, Cl. 239-741.000.
SmithKline Beckman Corporation: *See*—
Koestler, Thomas P., 4,701,408, Cl. 435-7.000.
Snider, Danny G.: *See*—
Kern, Mark T.; Hodges, Steven E.; Snider, Danny G.; and Shamordola, Kenneth A., 4,701,624, Cl. 250-554.000.
Snoble, Karel A. J.: *See*—
Kalnins, John M.; McIntyre, James A.; Moyer, John R.; Phillips, Robert F.; and Snoble, Karel A. J., 4,701,247, Cl. 204-131.000.
Soares, Paul, to Silicon Valley Group, Inc. Balance mechanism for movable jaw chuck of a spin station. 4,700,595, Cl. 82-40.00R.
Societe Anonyme Francaise du Ferodo: *See*—
Cadars, Patrick, 4,700,749, Cl. 138-38.000.
Societe Cogema, Framatome et Uranium Pechiney: *See*—
Vere, Bernard; and Mathevon, Paul, 4,700,824, Cl. 198-346.200.
Societe de Maintenance Electronique "SOMELEC": *See*—
Malcombe, Jean-Claude, 4,701,764, Cl. 343-742.000.
Societe Francaise de Stockage Geologique - Geostock: *See*—
Berezoutzky, Georges, 4,701,072, Cl. 405-53.000.
Societe Nationale des Chemins de Fer Francais: *See*—
Prasil, Bernard; and Turbe, Jean-Pierre, 4,700,564, Cl. 73-146.000.
Societe Nationale des Poudres et Explosifs: *See*—
Lagreze, Richard; and Malescot, Georges, 4,701,228, Cl. 149-109.600.
Societe Nationale Industrielle Aerospatiale: *See*—
Jonca, Henri V. J., 4,701,007, Cl. 350-96.100.
Soda, Yasunari; Mochiji, Kozo; Kimura, Takeshi; and Obayashyi, Hidehito, to Hitachi, Ltd. Linearly polarized X-ray patterning process. 4,701,940, Cl. 378-34.000.
Soft Sheen Products, Inc.: *See*—
Bernstein, Joel E., 4,701,321, Cl. 424-60.000.
Softly, Billy J.; and Huang, An S., to Nabisco Brands, Inc. Cider vinegar flavor. 4,701,336, Cl. 426-538.000.
Solorzano, Armando N.: *See*—
Robertson, Philip D.; and Solorzano, Armando N., 4,701,193, Cl. 55-217.000.
Sonar & Wells Testing Services, Inc.: *See*—
Anderson, Leo J., 4,701,892, Cl. 367-35.000.
Sonderegger, Hans-Conrad: *See*—
Baumgartner, Hans-Ulrich; Calderara, Reto; and Sonderegger, Hans-Conrad, 4,701,660, Cl. 310-338.000.
Sone, Yasuo: *See*—
Iwamoto, Masayuki; Araki, Setsuo; and Sone, Yasuo, 4,700,626, Cl. 101-230.000.
Sony Corporation: *See*—
Hasegawa, Norio; Fujino, Toyomi; and Matsubara, Susumu, 4,701,900, Cl. 369-36.000.
Ida, Mitsuru, 4,701,816, Cl. 360-96.400.
Ito, Seigo; and Murakami, Yoshikazu, 4,701,729, Cl. 333-219.000.
Mogi, Takao; and Morizono, Masahiko, 4,701,870, Cl. 364-580.000.
Omae, Kazuo; and Okazaki, Hiroshi, 4,701,802, Cl. 358-246.000.
Sasaki, Takayuki; and Arai, Masaaki, 4,701,871, Cl. 364-718.000.
Yada, Hiroaki; Imakoshi, Shigeyoshi; Suyama, Hideo; Sekiya, Tetsuo; and Nakayama, Masayuki, 4,701,815, Cl. 360-77.000.
Soo, Hwaili; and Robson, John H., to Union Carbide Corporation. Process for the production of alkylene glycols with metalate-containing solids. 4,701,571, Cl. 568-867.000.
Soto, Stephen: *See*—
Curtin, William J.; Soto, Stephen; and Krueger, Steven, 4,701,950, Cl. 379-214.000.
Soukup, Milan: *See*—
Lukac, Teodor; Soukup, Milan; and Widmer, Erich, 4,701,540, Cl. 549-341.000.
Soula, Gerard: *See*—
Le Ludec, Joel; Machurat, Jean; Morawski, Jean-Claude; and Soula, Gerard, 4,701,492, Cl. 524-493.000.
Southwest Research Institute: *See*—
Rollwitz, William L., 4,701,705, Cl. 324-306.000.
Soutschek, Ewald: *See*—
Schuetz, Alfred; Muller, Wolfgang; and Soutschek, Ewald, 4,701,634, Cl. 307-269.000.
Span America Medical Systems, Inc.: *See*—
Gammons, Clifford E., 4,701,168, Cl. 604-310.000.
Spann, Donald C., 4,700,447, Cl. 29-418.000.
Spann, Donald C., to Span America Medical Systems, Inc. Support pad and method of manufacture. 4,700,447, Cl. 29-418.000.
Specialty Mfg. Co., The: *See*—
Nelson, Terry N., 4,700,737, Cl. 137-355.270.
Spector, George: *See*—
Wade, Darrel E., Sr.; and Spector, George, 4,700,556, Cl. 70-455.000.
Spectra-Physics, Inc.: *See*—
Baer, Thomas M.; and Keirstead, Mark S., 4,701,929, Cl. 372-71.000.
Spectran Corporation: *See*—
Jaeger, Raymond E.; and Aslami, Mohd, 4,701,614, Cl. 250-227.000.
Speier, John L.: *See*—
Liles, Donald T.; and Speier, John L., 4,701,289, Cl. 264-8.000.
Speker, Karl J. Cover for frying and cooking appliances. 4,700,689, Cl. 126-384.000.
Spenceley, Gene D.; and Welbourn, Brian C., to British Steel Corporation. Melting of metals. 4,701,216, Cl. 75-59.100.
Spencer, Allen C.: *See*—
Grunwald, John J.; and Spencer, Allen C., 4,701,390, Cl. 430-325.000.
Sports Marketing, Inc.: *See*—
Vacanti, Eugene J., 4,700,403, Cl. 2-2.000.
Sprecace, Richard P.: *See*—
Filippi, Arthur M.; and Sprecace, Richard P., 4,700,863, Cl. 220-67.000.
Sraka, Robert: *See*—
Sraka, Stanko; and Sraka, Robert, 4,700,987, Cl. 297-159.000.
Sraka, Stanko; and Sraka, Robert. Folding table mechanism. 4,700,987, Cl. 297-159.000.
Staar S.A.: *See*—
d'Alayer de Costemor d'Arc, Stephane, 4,701,899, Cl. 369-36.000.
Stader, Harald, to Siemens Aktiengesellschaft. Circuit arrangement for suppressing interference signals on the receiving arm of a telephone subscriber line circuit. 4,701,947, Cl. 379-124.000.
Staendeke, Horst: *See*—
Fuchs, Fritz-Reichard; and Staendeke, Horst, 4,701,373, Cl. 428-326.000.
Stalzer, Henry: *See*—
DiGiulio, Peter C.; Hafner, Warren G.; and Stalzer, Henry, 4,701,856, Cl. 364-466.000.
Stammely, Thomas E.: *See*—
Annunziata, Eugene J.; Faress, James M., II; and Stammely, Thomas E., 4,701,630, Cl. 307-112.000.
Standard Elektrik Lorenz: *See*—
Kaiser, Manfred, 4,701,012, Cl. 350-96.190.
Standard Oil Company, The: *See*—
Henderson, Richard S.; Shreve, Gary A.; and Tenhover, Michael A., 4,701,226, Cl. 148-403.000.

Standard Telephones and Cables Public Limited Company: *See*—
Crossland, William A.; Walker, Christopher J. J.; and Davey, Anthony B., 4,701,029, Cl. 350-351.000.
Scarr, Robert W. A., 4,701,879, Cl. 365-49.000.

Standex Electronics (U.K.) Limited: *See*—
Hill, John; Bannister, Royston W.; and Turczanski, Henry, 4,701,735, Cl. 335-282.000.

Stanford University: *See*—
Perlmutter, Robert J., 4,701,006, Cl. 350-3.660.

Stanojevic, Silvo, to National Semiconductor Corporation. Threshold detector circuit and method. 4,701,639, Cl. 307-350.000.

State of Israel: *See*—
El-Hanany, Uri; Lachish, Uri; Rotter, Shlomo; and Adler, Eli, 4,701,607, Cl. 250-205.000.

Steer, Peter L., to Craig Medical Products. Ostomy appliance with improved attachment means. 4,701,169, Cl. 604-344.000.

Steilen, Ronald M.: *See*—
Bartusek, Robert J.; Steilen, Ronald M.; and Rettig, Vernon E., 4,700,785, Cl. 172-705.000.

Stellmach, Dieter: *See*—
Wysk, Hans-Joachim; Stellmach, Dieter; Nolte, Bernhard; Gronwald, Gerd; and Maedge, Werner, 4,701,063, Cl. 400-621.000.

Stemcor Corporation: *See*—
Boecker, Wolfgang D. G.; Hailey, Laurence N.; and McMurtry, Carl H., 4,701,427, Cl. 501-92.000.

Steneck, Walter G.: *See*—
Stupp, Edward H.; Fellows, Mark W.; and Steneck, Walter G., 4,701,671, Cl. 315-224.000.

Stenkvist, Sven-Einar: *See*—
Rappinger, Bo; and Stenkvist, Sven-Einar, 4,701,931, Cl. 373-72.000.

Stephen, John F.: *See*—
Nelson, Richard V.; and Stephen, John F., 4,701,485, Cl. 524-98.000.

Stephens, Richard B.: *See*—
Deckman, Harry W.; Stephens, Richard B.; Tiedje, J. Thomas; and Abeles, Benjamin, 4,701,366, Cl. 428-188.000.

Sterba, Richard F.; and Slade, James R., Jr. Multi-function weight lifting exercise system. 4,700,944, Cl. 272-117.000.

Sternberg, Joseph E. Baseball glove. 4,700,405, Cl. 2-19.000.

Stevens, Robert A., to Kimberly-Clark Corporation. Form-fitting self-adjusting disposable garment with fully integrated absorbent structure. 4,701,172, Cl. 604-385.00A.

Stevens, Robert A.: *See*—
Boland, Leona G.; Zehner, Georgia L.; and Stevens, Robert A., 4,701,171, Cl. 604-385.00A.
Boland, Leona G.; and Stevens, Robert A., 4,701,175, Cl. 604-385.00A.
Kellenberger, Stanley R.; Rajala, Gregory J.; and Stevens, Robert A., 4,701,179, Cl. 604-394.000.
Wilson, John C.; Stevens, Robert A.; Boland, Leona G.; Rajala, Gregory J.; and Kellenberger, Stanley R., 4,701,170, Cl. 604-385.00A.
Wilson, John C.; Stevens, Robert A.; and Kellenberger, Stanley R., 4,701,176, Cl. 604-385.00A.
Zehner, Georgia L.; Boland, Leona G.; and Stevens, Robert A., 4,701,173, Cl. 604-385.00A.

Stewart, David R.: *See*—
Keranen, John J.; Peret, Scot F.; and Stewart, David R., 4,701,578, Cl. 200-5.00B.

Stewart, James B., to Kidde Consumer Durables Corp. Microwave browning cookware. 4,701,585, Cl. 219-10.55E.

Steyr-Daimler-Puch AG: *See*—
Friedrich, Karl; and Lanzer, Heribert, 4,700,800, Cl. 180-249.000.

Stillman, Neil W.; and Geiger, John T., to Applied Biochemists Inc. Apparatus for dispensing a water treating composition into the recirculating water of an evaporative system. 4,701,286, Cl. 261-36.100.

Stipanuk, James J.: *See*—
Birrittella, Mark S.; and Stipanuk, James J., 4,701,882, Cl. 365-154.000.

Stohr, Albert, to Gebr. Hennig GmbH. Cabin-like cover. 4,700,517, Cl. 52-241.000.

Stokes, John H.; Clark, John I.; Morris, James D.; and Ward, Steven M., to Energy Optics Inc. Nonvolatile realtime clock calendar module. 4,701,858, Cl. 364-483.000.

Stoll, Kurt; and Hihn, Gerhard. Piston and cylinder unit. 4,700,616, Cl. 92-118.000.

Stolzenberg, Hans: *See*—
Kempken, Rainer; and Stolzenberg, Hans, 4,700,957, Cl. 279-117.000.

Storimans, Franciscus J. A., to GPD Canada Inc. Electronic component spacer mechanism. 4,700,753, Cl. 140-147.000.

Stork Ketels B.V.: *See*—
Kreuwel, Johannes G.; and Schipper, Lambert A., 4,701,191, Cl. 55-198.000.

Story, Martha F.: *See*—
Shimirak, Gerlad L.; Hunter, Thomas; Story, Martha F.; Halstead, W. G.; Chan, Paul S.; and Swinmurn, Christopher J., 4,701,574, Cl. 174-93.000.

Strand, Jerome E., to Minnesota Mining and Manufacturing Company. Electrical connector. 4,700,997, Cl. 439-372.000.

Stranford, Gerald T.: *See*—
Lester, George R.; Gonczy, Stephen T.; Welsh, Lawrence B.; and Stranford, Gerald T., 4,701,316, Cl. 423-344.000.

Strate, Hans; and Simon, Hans-Dieter, to H. Wohlenberg KG GmbH & Co. Turning machine. 4,700,453, Cl. 29-568.000.

Strickland, Benjamin W. Solar apparatus. 4,700,690, Cl. 126-424.000.

Stubbersfield, Beryl Grace: *See*—
Stubbersfield, Edgar M., 4,701,061, Cl. 384-484.000.

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Stude, Rolf-Rudiger: *See*—
Koching, Horst; and Stude, Rolf-Rudiger, 4,701,118, Cl. 425-185.000.

Studiecentrum voor Kernenergie, "S.C.K.": *See*—
Weyers, Charles; Klein, Michel; and Goossens, Walter, 4,701,194, Cl. 55-228.000.

Stupp, Edward H.; Fellows, Mark W.; and Steneck, Walter G., to North American Philips Corporation. High-frequency oscillator-inverter ballast circuit for discharge lamps. 4,701,671, Cl. 315-224.000.

Sturgill, Dennis T., to Owens-Illinois, Inc. Inspection of container finish. 4,701,612, Cl. 250-223.00B.

Sturtz, Charles R., to FMC Corporation. Rear platform lift. 4,701,097, Cl. 414-495.000.

Stutt, Charles A.; and Gajjar, Jagdish T., to General Electric Company. Method and apparatus for obtaining reliable synchronization over a noisy channel. 4,701,939, Cl. 375-115.000.

Suchowerskyj, Wadym: *See*—
Gademann, Lothar; Mattes, Bernhard; Mausner, Eberhard; Suchowerskyj, Wadym; and Rittmannsberger, Norbert, 4,700,973, Cl. 280-735.000.

Suda, Minoru: *See*—
Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, 4,701,539, Cl. 549-294.000.

Sueda, Tetsuo: *See*—
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,701,392, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,701,393, Cl. 430-57.000.

Sueddeutsche Kuehlerfabrik Julius F. Behr. GmbH: *See*—
Schwarz, Gebhard, 4,700,774, Cl. 165-140.000.

Suehiro, Yoshiyuki: *See*—
Naitoh, Mitsugu; and Suehiro, Yoshiyuki, 4,701,919, Cl. 371-21.000.

Sugahara, Koichi: *See*—
Ashizaki, Shigeya; Sugahara, Koichi; Muranishi, Hideo; and Natsuhara, Masao, 4,701,677, Cl. 315-382.000.

Sugimori, Shigeru; and Kojima, Tetsuhiko, to Chisso Corporation. High temperature liquid-crystalline ester compounds. 4,701,547, Cl. 560-102.000.

Sugimoto, Kenichi: *See*—
Tanabe, Yoshimitsu; Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,701,567, Cl. 568-719.000.

Sugita, Kazuhiko: *See*—
Namba, Yoshiharu; Suzuki, Hiroshi; and Sugita, Kazuhiko, 4,700,510, Cl. 51-134.50R.

Sugita, Yutaka: *See*—
Imura, Ryo; Ikeda, Tadashi; and Sugita, Yutaka, 4,701,385, Cl. 428-693.000.

Sugitani, Hiroshi; Ozawa, Masakazu; Matsuda, Hiroto; Ikeda, Masami; and Matsumoto, Haruyuki, to Canon Kabushiki Kaisha. Method of making an ink jet head involving in-situ formation of an orifice plate. 4,701,766, Cl. 346-1.100.

Sugiura, Noboru: *See*—
Doi, Shunichi; Sugiura, Noboru; Hayashi, Yasutaka; and Yamamoto, Yuzo, 4,700,971, Cl. 280-707.000.

Suh, John T.; and Barton, Jeffrey N., to USV Pharmaceutical Corporation. Substituted cyclic amines. 4,701,461, Cl. 514-317.000.

Suhner Intertrade AG: *See*—
Fumey, Jurg, 4,701,082, Cl. 408-127.000.

Suhonen, Tuomo: *See*—
Kuusela, Juhani; Lopperi, Esko; Lummila, Markku; Saksala, Pertti; Salovaara, Esa; Suhonen, Tuomo; Perttina, Harri; Poikolainen, Esko; and Trygg, Hannu, 4,700,953, Cl. 277-38.000.

Sukup Manufacturing Company: *See*—
Meyer, Marvin G., 4,701,093, Cl. 414-312.000.

Sullivan, Leroy J., to Branscomb Corporation N.V. Ammunition round. 4,700,630, Cl. 102-439.000.

Sulzer Brothers Limited: *See*—
Baumberger, Peter, 4,700,772, Cl. 165-103.000.
Medgvesy, Stephen, 4,701,103, Cl. 415-219.00C.
Russak, Steffen P., 4,700,925, Cl. 251-73.000.

Sumi, Kazumasa: *See*—
Miki, Kazuo; Hayashi, Yasutaka; Fukui, Katsuhiko; and Sumi, Kazumasa, 4,700,960, Cl. 280-91.000.

Sumigawa, Yukio, to Sanshin Kogyo Kabushiki Kaisha. Steering device for an outboard motor. 4,701,141, Cl. 440-55.000.

Sumitomo Chemical Company, Limited: *See*—
Kayane, Yutaka; Sawamoto, Hirokazu; Omura, Takashi; Harada, Naoki; and Takeshita, Akira, 4,701,524, Cl. 534-642.000.
Sasaki, Mitsuru; and Oguri, Yukio, 4,701,209, Cl. 71-97.000.

Sumitomo Electric Industries, Ltd.: *See*—
Saito, Yasunori; Ichikawa, Osamu; and Oshima, Toshio, 4,701,015, Cl. 350-96.230.

Sun Coast Plastics, Inc.: *See*—
Dutt, Herbert V.; and Weir, Dixie L., 4,700,867, Cl. 220-410.000.

Sun, Robert L.; and Kenney, James F., to Johnson & Johnson Products, Inc. N-vinyl caprolactam-containing hot melt adhesives. 4,701,509, Cl. 526-264.000.

Sunbeam Corporation: *See*—
Elger, John H., 4,700,621, Cl. 99-511.000.
Sundberg, Carl-Erik: *See*—
Kavehrad, Mohsen; and Sundberg, Carl-Erik, 4,701,909, Cl. 370-85.000.
Sundstrand Corporation: *See*—
Biagini, Guido, 4,700,549, Cl. 62-149.000.
Cohen, Modehy, 4,701,104, Cl. 416-44.000.
Sundstrand Data Control, Inc.: *See*—
Brady, Arthur R., 4,700,910, Cl. 244-1.00R.
Sung, Chiakang: *See*—
Millhollan, Michael S.; and Sung, Chiakang, 4,701,636, Cl. 307-297.000.
Sunohara, Masaaki: *See*—
Ito, Akio; Mochizuki, Hideaki; Sunohara, Masaaki; and Tamura, Tooru, 4,701,770, Cl. 346-135.100.
Suntory Limited: *See*—
Tanaka, Takaharu; Higuchi, Naoki; Saito, Masayuki; and Hashimoto, Masaki, 4,701,210, Cl. 71-98.000.
Tanaka, Takaharu; Saitoh, Masayuki; Hashimoto, Masaki; and Higuchi, Naoki, 4,701,465, Cl. 514-423.000.
Suprono, Paul W., to Nortek Corporation. Electrical terminal and method of assembly. 4,701,000, Cl. 439-423.000.
Surface Technology, Inc.: *See*—
Lindsay, Deborah J., 4,701,350, Cl. 427-97.000.
Susumu, Kubo; Tsutomu, Ikeda; Yoichi, Takanami; and Yoichi, Mikami, to Japan Tobacco Inc. Novel protein and plant-virus disease preventive agents. 4,701,522, Cl. 530-370.000.
Sutor, Judy L.: *See*—
Wrathall, Robert S.; and Sutor, Judy L., 4,701,718, Cl. 330-253.000.
Suyama, Hideo: *See*—
Yada, Hiroaki; Imakoshi, Shigeyoshi; Suyama, Hideo; Sekiya, Tetsuo; and Nakayama, Masayuki, 4,701,815, Cl. 360-77.000.
Suzuki, Hideki: *See*—
Kawaguchi, Toshiyuki; Suzuki, Hideki; and Usuda, Tsuneo, 4,701,279, Cl. 252-511.000.
Suzuki, Hiroshi: *See*—
Namba, Yoshiharu; Suzuki, Hiroshi; and Sugita, Kazuhiko, 4,700,510, Cl. 51-134.50R.
Suzuki, Hirosuke; and Imaizumi, Haruo, to Junkosha Co., Ltd. Dielectric material in sheet form. 4,701,362, Cl. 428-131.000.
Suzuki, Hitomi: *See*—
Oku, Kentaro; Fukushima, Masakazu; Suzuki, Hitomi; and Maruyama, Masanori, 4,701,668, Cl. 315-17.000.
Suzuki, Hitoshi: *See*—
Nagai, Masahide; Noda, Minoru; and Suzuki, Hitoshi, 4,701,100, Cl. 414-751.000.
Suzuki, Kouji; Ikeda, Mitsushi; and Aoki, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacture thin film transistor. 4,700,458, Cl. 437-83.000.
Suzuki, Masaru: *See*—
Henmi, Yoshiyasu; Terada, Takashi; Suzuki, Masaru; and Ninomiya, Hiroshi, 4,701,327, Cl. 424-455.000.
Suzuki, Osamu: *See*—
Oishi, Kengo; and Suzuki, Osamu, 4,701,822, Cl. 360-132.000.
Suzuki, Yoshinori: *See*—
Sakakibara, Yasuhiro; Kobayashi, Isamu; and Suzuki, Yoshinori, 4,701,886, Cl. 365-189.000.
Suzuki, Yoshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Color cathode-ray tube. 4,701,665, Cl. 313-402.000.
Swaringen, Roy A., Jr.: *See*—
El-Sayad, Hassan A.; Swaringen, Roy A., Jr.; and Yeowell, David A., 4,701,460, Cl. 514-308.000.
Swearingen, Loren L.; Embrey, Wallace E.; LaTulip, Randy J.; Earls, Jim D.; and McConchie, Garnet E., to Dow Chemical Company, The. Single pass process for making trimethyl pyridine. 4,701,529, Cl. 546-251.000.
Swearingen, Loren L.; and LaTulip, Randy J., to Dow Chemical Company, The. Two-stage process for making trimethyl pyridine. 4,701,530, Cl. 546-251.000.
Swenson, Paula S., to Neptune Corporation. Illuminated infant toy. 4,701,146, Cl. 446-130.000.
Swinkels, Dominicus A.; Fredericks, Peter M.; and Osborn, Paul R., to Broken Hill Proprietary Co., Ltd., The. Characterizing and handling multi-component substances. 4,701,838, Cl. 364-164.000.
Swinmurn, Christopher J.: *See*—
Shimirak, Gerlad L.; Hunter, Thomas; Story, Martha F.; Halstead, W. G.; Chan, Paul S.; and Swinmurn, Christopher J., 4,701,574, Cl. 174-93.000.
Swiss Aluminium Ltd.: *See*—
Pfister, Hans, 4,700,612, Cl. 91-471.000.
Synthelabo: *See*—
Purcell, Thomas; and Zard, Lydia, 4,701,466, Cl. 514-450.000.
Szirmai, Stephen G.; Newman, Gerard R.; and Kelly, Philip L., to Commonwealth Scientific and Industrial Research Organization (CSIRO); and Unisearch Limited. Radiation source. 4,701,941, Cl. 378-122.000.
Szluk, Nicholas J., to NCR Corporation. Totally self-aligned CMOS process. 4,701,423, Cl. 437-57.000.
T & R Chemicals, Inc.: *See*—
Arias, Jose A., 4,701,446, Cl. 514-65.000.
Tabei, Masatoshi; and Kawajiri, Kazuhiro, to Fuji Photo Film Co., Ltd. Electronic still camera system with differential error-correcting means. 4,701,798, Cl. 358-213.260.
Tachikawa, Satoru: *See*—
Senba, Takashi; and Tachikawa, Satoru, 4,700,572, Cl. 73-622.000.
Taguchi, Masayuki, to Amada Company, Limited. Method and apparatus for controlling the feeding of a bandsaw blade in bandsaw machines. 4,700,596, Cl. 83-13.000.
Taguchi, Masayuki, to Amada Company, Limited. Method for controlling cutting machines. 4,700,597, Cl. 83-13.000.
Taguchi, Tetsu, to NEC Corporation. Variable frame length vocoder. 4,701,955, Cl. 381-51.000.
Tai, Henry T.: *See*—
Brown, Eric W.; and Tai, Henry T., 4,701,159, Cl. 604-43.000.
Tajima, Noriyasu; Sakura, Yasuhiro; Futakata, Takashi; Senda, Kouji; and Seki, Kazuaki, to Tokyo Electric Co., Ltd. Indication method in balance with item indicator. 4,700,792, Cl. 177-178.000.
Takada, Jun: *See*—
Kuwahara, Hideyuki; Kondo, Bunji; Takada, Jun; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,701,301, Cl. 419-21.000.
Takada, Katsuhiro, to Olympus Optical Co., Ltd. Graded refractive index lens system. 4,701,032, Cl. 350-413.000.
Takagi, Akinobu: *See*—
Otobe, Yutaka; Kato, Akira; Hosoda, Fumio; and Takagi, Akinobu, 4,700,679, Cl. 123-327.000.
Takagi, Susumu, to Hewlett-Packard Company. Apparatus for measuring characteristics of circuit elements. 4,701,701, Cl. 324-158.00R.
Takahashi, Masanobu: *See*—
Endo, Kazuyuki; Taniguchi, Motoaki; Takahashi, Masanobu; Yamada, Shigeki; and Kato, Kenshiro, 4,700,764, Cl. 152-526.000.
Takahashi, Shuji: *See*—
Yashima, Michio; and Takahashi, Shuji, 4,700,795, Cl. 180-68.500.
Takahashi, Takashi: *See*—
Imai, Motomasa; Harata, Mitsuo; Takahashi, Takashi; and Nishijima, Kazuo, 4,701,767, Cl. 346-74.200.
Tsuji, Jiro; and Takahashi, Takashi, 4,701,536, Cl. 549-215.000.
Takahashi, Takayuki: *See*—
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Takakura, Toshihiko: *See*—
Okada, Daisuke; Uchida, Akihisa; Takakura, Toshihiko; Nakashima, Shinji; Ohno, Nobuhiko; and Ogiue, Katsumi, 4,700,464, Cl. 437-67.000.
Takamatsu Electric Works, Ltd.: *See*—
Mitsukuchi, Kunio; Ito, Hiromitsu; Eguchi, Isamu; Hirasato, Bunji; and Furuhata, Takashi, 4,701,583, Cl. 200-148.00B.
Takamiya, Saburo: *See*—
Seiwa, Yoshito; and Takamiya, Saburo, 4,701,926, Cl. 372-45.000.
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Kaji, Isao; Hasegawa, Masakazu; Tan, Masayuki; and Kurata, Masaru, to Fujikura Ltd. Apparatus for jointing CV cables. 4,701,117, Cl. 425-116.000.
Takashima, Shigekazu; and Sakamoto, Tsutomu, to Kabushiki Kaisha Toshiba. Memory control apparatus for a CRT controller. 4,701,864, Cl. 364-521.000.
Takashima, Toshiyuki: *See*—
Kondo, Kiyoshi; Takashima, Toshiyuki; and Suda, Minoru, 4,701,539, Cl. 549-294.000.
Takashima, Yosuke, to NEC Corporation. Adaptive pseudo halftone generator. 4,701,806, Cl. 358-283.000.
Takata, Harry H., to AG-CHEM Equipment Co., Inc. Hydraulic metering control. 4,700,895, Cl. 239-664.000.
Takauji, Kiyomi; and Kondo, Tatsunori, to Kabushiki Kaisha Kawai Gakki Seisakusho. Formant filter generator for an electronic musical instrument. 4,700,603, Cl. 84-1.190.
Takayama, Kenzo, to Canon Kabushiki Kaisha. Image forming apparatus. 4,701,043, Cl. 355-3.0DD.
Takayama, Suguru: *See*—
Nishimatsu, Masaharu; Takayama, Suguru; and Arioka, Hiroyuki, 4,701,375, Cl. 428-336.000.
Takayama, Yoshihisa; Fujii, Shigeru; and Tanabe, Tomoaki, to Fujitsu Limited. Gate array type semiconductor integrated circuit device. 4,701,777, Cl. 357-42.000.
Takeda Chemical Industries, Inc.: *See*—
Horii, Satoshi; Kameda, Yukihiko; and Fukase, Hiroshi, 4,701,559, Cl. 564-363.000.
Takeda Chemical Industries, Ltd.: *See*—
Miyagawa, Kenichiro; Doi, Muneharu; and Akiyama, Shun-ichi, 4,701,413, Cl. 435-88.000.
Takeda, Isamu: *See*—
Matsuo, Junichi; Sakano, Kozaburo; and Takeda, Isamu, 4,700,871, Cl. 222-107.000.
Takeda Riken Kogyo Kabushikikaisha: *See*—
Nakajima, Takayuki; Aoki, Tetsuo; Kobayashi, Katsumi; and Akiyama, Noboru, 4,701,918, Cl. 371-20.000.
Takeda, Ryuzaburo: *See*—
Yamamoto, Etsuji; Kohno, Hideki; and Takeda, Ryuzaburo, 4,701,709, Cl. 324-312.000.
Takeshita, Akira: *See*—
Kayane, Yutaka; Sawamoto, Hirokazu; Omura, Takashi; Harada, Naoki; and Takeshita, Akira, 4,701,524, Cl. 534-642.000.
Takeuchi, Hirotaka; Asai, Jiro; Yamada, Yasuhumi; and Yanase, Sumio, to Nippondenso Co., Ltd. Rectifying system for magnet-type AC generator. 4,701,692, Cl. 322-90.000.
Takeuchi, Hitoshi; and Ooishi, Shogo, to Toyota Jidosha Kabushiki Kaisha. Rotary type electrostatic spray painting device. 4,700,896, Cl. 239-693.000.
Takigawa, Koichi: *See*—
Saito, Kaoru; Noji, Akio; Kakuta, Yonehiro; and Takigawa, Koichi, 4,700,479, Cl. 33-366.000.

Takiguchi, Hideki; Yamada, Yoshitaka; Ohtani, Hirofumi; and Kashiwagi, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Dye-sensitized light-sensitive core/shell silver halide photographic material. 4,701,405, Cl. 430-567.000.

Tallman, William R.; and Kaplan, Robert A., to Scott & Fetzer Company, The. Gas fuel burner. 4,701,123, Cl. 431-171.000.

Tamaki, Shigenori; Machizuki, Hiroyuki; Kobayashi, Nobuo; Iwase, Takahiro; and Masuda, Naofumi, to Toyota Jidosha Kabushiki Kaisha. Method for coating metal part with synthetic resin. 4,701,346, Cl. 427-46.000.

Tamaki, Yoshihiro: *See*—
Hashimoto, Hitoshi; Tamaki, Yoshihiro; Mikami, Kazufumi; and Shimogai, Kiyoshi, 4,701,081, Cl. 408-1.00R.

Tamiya, Yoichiro: *See*—
Morita, Koyo; Nomura, Keizo; Nishizuka, Hiroshi; Hoshi, Tai; Tamiya, Yoichiro; and Asakawa, Terushige, 4,701,608, Cl. 250-205.000.

Tamura, Tooru: *See*—
Ito, Akio; Mochizuki, Hideaki; Sunohara, Masaaki; and Tamura, Tooru, 4,701,770, Cl. 346-135.100.

Tan, Masayuki: *See*—
Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; Kaji, Isao; Hasegawa, Masakazu; Tan, Masayuki; and Kurata, Masaru, 4,701,117, Cl. 425-116.000.

Tanabe, Tomoaki: *See*—
Takayama, Yoshihisa; Fujii, Shigeru; and Tanabe, Tomoaki, 4,701,777, Cl. 357-42.000.

Tanabe, Yoshimitsu; Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Sugimoto, Kenichi; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Process for producing 6,6'-dihydroxy-3,3,3',3'-tetramethyl-1,1'-spirobiindane. 4,701,567, Cl. 568-719.000.

Tanabe, Yoshio: *See*—
Iwasaki, Yoshitaka; Mori, Kunio; and Tanabe, Yoshio, 4,700,791, Cl. 177-2.000.

Tanahashi, Toshio: *See*—
Uranishi, Koji; Ito, Takaaki; and Tanahashi, Toshio, 4,701,198, Cl. 55-387.000.

Tanaka, Fujio; and Imamura, Nobutake, to Kokusai Denshin Denwa Kabushiki Kaisha. Magneto-optical recording medium. 4,701,881, Cl. 365-122.000.

Tanaka, Fuminari: *See*—
Sahoda, Masayuki; Tanaka, Fuminari; and Iida, Tetsuya, 4,701,877, Cl. 364-784.000.

Tanaka, Hideharu; Sekiya, Mutsuo; and Uchikawa, Fusaoki, to Mitsubishi Denki Kabushiki Kaisha. Muffler for exhaust gas from internal combustion engine. 4,700,805, Cl. 181-265.000.

Tanaka, Katsuhiko, to Nippon Seiko Kabushiki Kaisha. Motor unit. 4,701,651, Cl. 310-90.000.

Tanaka, Kunimaro; and Ozaki, Minoru, to Mitsubishi Denki Kabushiki Kaisha. PCM recording and reproducing apparatus. 4,701,812, Cl. 360-32.000.

Tanaka, Takaharu; Higuchi, Naoki; Saito, Masayuki; and Hashimoto, Masaki, to Suntory Limited. N-substituted glutamic acid derivative and process for production and use thereof. 4,701,210, Cl. 71-98.000.

Tanaka, Takaharu; Saitoh, Masayuki; Hashimoto, Masaki; and Higuchi, Naoki, to Suntory Limited. N-acylpyrrolidine derivative and synthesis and use thereof. 4,701,465, Cl. 514-423.000.

Tanaka, Yoichiro: *See*—
Sagoi, Masayuki; Tanaka, Yoichiro; and Nakamura, Hiroki, 4,701,374, Cl. 428-336.000.

Tangonan, Gregory L.; and Yen, Huan-Wun, to Hughes Aircraft Company. Spectral filter for integrated optics. 4,701,009, Cl. 350-96.120.

Taniguchi, Motoaki: *See*—
Endo, Kazuyuki; Taniguchi, Motoaki; Takahashi, Masanobu; Yamada, Shigeki; and Kato, Kenshiro, 4,700,764, Cl. 152-526.000.

Tanimoto, Akikazu; and Ishizaka, Shoji, to Nippon Kogaku K.K. Projection optical apparatus. 4,701,606, Cl. 250-201.000.

Tari, Gabor; Bereczki, Gabor; and Blaskovics, Ferenc, to Metripond Merleggyar. Head restraining device for operating procedures on the head. 4,700,691, Cl. 128-1.00R.

Tatukawa, Juniti; and Kirihara, Shozo, to Nippondenso Co., Ltd. Rotor structure of magneto generator. 4,701,654, Cl. 310-153.000.

Tauber, Klaus: *See*—
Dommer, Erich; Rechtziegel, Bruno; and Tauber, Klaus, 4,701,302, Cl. 420-470.000.

Tauschek, Georg: *See*—
Schmid, Anton; Tauschek, Georg; Sedlmeier, Andreas; and Pollok, Peter, 4,700,446, Cl. 29-159.200.

Taves, Marvin J.: *See*—
Keyes, Paul H.; and Taves, Marvin J., 4,700,872, Cl. 222-162.000.

Tawada, Yoshihisa; and Tsuge, Kazunori, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Film forming process. 4,701,344, Cl. 427-39.000.

Taylor, Carl R.: *See*—
Gartside, Charles H., III; Levy, Alvin C.; Overton, Bob J.; and Taylor, Carl R., 4,701,016, Cl. 350-96.230.

Taylor, Dennis R.; and Gallavan, Kevin P., to Kaiser Aluminum & Chemical Corporation. Treating compositions for used frying oils. 4,701,438, Cl. 502-405.000.

Taylor, Glenn N.: *See*—
Widinski, Paul R.; and Taylor, Glenn N., 4,700,943, Cl. 272-96.000.

Taylor, Herbert, to Bijur Lubricating Corp. Pressure locking filler cap. 4,700,866, Cl. 220-316.000.

Taylor, Jefferson H. Frequency attenuation compensated pneumatic headphone and liquid tube audio system for medical use. 4,701,952, Cl. 381-25.000.

Taylor, Stewart S.: *See*—
Penney, Bruce J.; and Taylor, Stewart S., 4,701,694, Cl. 323-317.000.

TDK Corporation: *See*—
Nishimatsu, Masaharu; Takayama, Suguru; and Arioka, Hiroyuki, 4,701,375, Cl. 428-336.000.

Teac Corp. & Nippon Landex Ltd.: *See*—
Uemura, Yasuhiro, 4,701,817, Cl. 360-96.500.

Tehranian, Michael M.: *See*—
Goodrich, Gerald O.; Tehranian, Michael M.; and White, Donald A., 4,701,841, Cl. 364-200.000.

Teitzel, Robin L.: *See*—
Bogardus, David W.; Teitzel, Robin L.; and Chapman, David D., 4,701,696, Cl. 324-73.00R.

Tekno-Detaljer Lindstrom & Waerme AB: *See*—
Larsson, Jan S., 4,701,589, Cl. 219-50.000.

Tektronix, Inc.: *See*—
Agoston, Agoston, 4,701,714, Cl. 328-56.000.
Bogardus, David W.; Teitzel, Robin L.; and Chapman, David D., 4,701,696, Cl. 324-73.00R.
Penney, Bruce J.; and Taylor, Stewart S., 4,701,694, Cl. 323-317.000.

Teledyne Industries, Inc.: *See*—
Pearce, P. Glenn, 4,700,680, Cl. 123-383.000.

Teleflex Incorporated: *See*—
Caulfield, Leonard, 4,700,485, Cl. 33-143.00L.

Telettra-Telefonia Elettronica e Radio, S.p.A.: *See*—
Donzelli, Giampiero, 4,700,467, Cl. 437-209.000.

Telex Communications, Inc.: *See*—
Flygstad, Dean W.; and Tromborg, Craig E., 4,701,640, Cl. 307-400.000.

Telex Computer Products, Inc.: *See*—
Lohrenz, Marold H.; Thies, Joel O.; and Jednacz, Scott T., 4,700,909, Cl. 242-182.000.

Tenhover, Michael A.: *See*—
Henderson, Richard S.; Shreve, Gary A.; and Tenhover, Michael A., 4,701,226, Cl. 148-403.000.

Terada, Takashi: *See*—
Henmi, Yoshiyasu; Terada, Takashi; Suzuki, Masaru; and Ninomiya, Hiroshi, 4,701,327, Cl. 424-455.000.

Teraoka Seiko Co., Ltd.: *See*—
Iwasaki, Yoshitaka; Mori, Kunio; and Tanabe, Yoshio, 4,700,791, Cl. 177-2.000.

Terazawa, Masaaki: *See*—
Komiya, Ryohei; and Terazawa, Masaaki, 4,701,768, Cl. 346-74.400.

Terry, Harold: *See*—
Fossati, Giorgio; Terry, Harold; and Manco, Giuseppe, 4,700,748, Cl. 137-877.000.

Terumo Corp.: *See*—
Fujii, Tadashi; Yagami, Hiroyuki; Seo, Iwao; and Sasaki, Masahiro, 4,701,659, Cl. 310-334.000.

Tescom Corporation: *See*—
Hamernik, Edward L.; and Patterson, Daryll D., 4,700,735, Cl. 137-270.000.

Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. Resolution of hemiacetals and alcohols. 4,701,542, Cl. 549-456.000.

Texaco Inc.: *See*—
Huang, Wann-Sheng; and Hight, Margaret A., 4,700,779, Cl. 166-263.000.

Texaco Inc., White: *See*—
Powell, Justin C., 4,701,553, Cl. 562-504.000.

Texas Instruments Incorporated: *See*—
Beggs, Louis C.; and D'Entremont, John R., 4,701,824, Cl. 361-24.000.
Chun, Jino, 4,701,633, Cl. 307-269.000.
McElroy, David J., 4,701,885, Cl. 365-189.000.
Powell, Theo J.; and Hwang, Yin-Chao, 4,701,921, Cl. 371-25.000.
Scott, Warner C., 4,701,960, Cl. 382-3.000.

Textron Inc.: *See*—
Crull, Russell L., 4,701,088, Cl. 411-369.000.

Thach, Sophany; Salter, Stephen J.; Meyers, Kevin O.; and Giordano, Ronald M., to Atlantic Richfield Company. Treating oil-water-surfactant emulsions with strong inorganic acid. 4,701,271, Cl. 252-8.554.

Thaler, Arnold, to Windmere Corporation. Lens cleaning device. 4,700,729, Cl. 134-139.000.

Thaler, Warren A.: *See*—
Duvdevani, Ilan; Manalastas, Pacifico V.; Drake, Evelyn N.; and Thaler, Warren A., 4,701,204, Cl. 71-28.000.
Mintz, Donald J.; Peiffer, Dennis G.; Thaler, Warren A.; and Duvdevani, Ilan, 4,701,263, Cl. 210-728.000.

Thermal Dynamics Corporation: *See*—
Hatch, Bruce O., 4,701,590, Cl. 219-121.0PR.

Thermoguard Equipment Inc.: *See*—
Shill, David, 4,700,941, Cl. 271-151.000.

Thies, Joel O.: *See*—
Lohrenz, Marold H.; Thies, Joel O.; and Jednacz, Scott T., 4,700,909, Cl. 242-182.000.

Thomas, Bradley S.: *See*—
Penney, Carl M.; and Thomas, Bradley S., 4,701,031, Cl. 350-371.000.

Thomas, Harold F.; and Deimen, James M., to Thomas, Harold F. Protected automotive battery access terminals. 4,700,961, Cl. 280-152.00A.

Thomas, Hugh: *See*—
Nelson, Charles R.; and Thomas, Hugh, 4,701,268, Cl. 252-8.800.

Thomas, Michael D., to Sanders Associates, Inc. Frequency discriminating laser. 4,701,924, Cl. 372-19.000.

Thompson, Michael D.; and Madding, Gary D., to Bristol-Myers Company. Intermediates useful in the preparation of 3,4-dihydro-4-oxothieno[2,3-d]pyrimidine-2-carboxylates and process for preparing same. 4,701,528, Cl. 544-278.000.

Thompson, Richard F.; Disney, Daniel J.; Quek, Swee-meng; and Westerfeld, Eric C., to Motorola Computer Systems, Inc. Dual cache for independent prefetch and execution units. 4,701,844, Cl. 364-200.000.

Thomsen, Peter N.: *See*—
Rutter, Christopher C.; and Thomsen, Peter N., 4,700,744, Cl. 137-614.040.

Thomson-CGR: *See*—
Chambron, Edmond, 4,700,938, Cl. 269-322.000.

Thomson-CSF: *See*—
Guyot, Lucien, 4,701,792, Cl. 358-111.000.
Le Pesant, Jean-Pierre; Hareng, Michel; Mourey, Bruno; and Perbet, Jean-Noel, 4,701,021, Cl. 350-267.000.

Thorndyke, Robert J., to Atlantis Projects Inc. Transportation van having load elevating platform located therein. 4,701,086, Cl. 410-26.000.

Thornton, Donald I.; and Rodman, Clarke A., to Allied Corp. Molded panel filter. 4,701,197, Cl. 55-487.000.

Thornton, Lawrence E.: *See*—
Eaton, Favre E.; Brazant, James F.; and Thornton, Lawrence E., 4,701,713, Cl. 324-442.000.

Thunberg, Allen L.; and Reczek, James A., to Eastman Kodak Company. Analytical compositions, elements and methods utilizing reduction of ferric ion chelates to form detectable dyes. 4,701,420, Cl. 436-94.000.

Tibbals, Edward C., Jr., to Loeffler, William R. Single ball traction drive assembly. 4,700,581, Cl. 74-198.000.

Tidewater Industrial Components, Inc.: *See*—
Burke, David D., 4,701,192, Cl. 55-213.000.

Tiedje, J. Thomas: *See*—
Deckman, Harry W.; Stephens, Richard B.; Tiedje, J. Thomas; and Abeles, Benjamin, 4,701,366, Cl. 428-188.000.

TII Industries, Inc.: *See*—
Pagliuca, Emanuel J., 4,701,825, Cl. 361-119.000.

Tiljander, Ossi, to Oy Partek AB. Hydraulic motor with stationary axle and rotating fluid distributor. 4,700,613, Cl. 91-485.000.

Timber Textures (UK) Limited: *See*—
Cottingham, Richard L., 4,701,355, Cl. 427-317.000.

Timmons, Michael B., to Cornell Research Foundation, Inc. Environmental control system for poultry houses. 4,700,887, Cl. 236-49.000.

Ting, Chiu H.: *See*—
Baerg, William; Ting, Chiu H.; Siu, Byron B.; and Tzeng, J. C., 4,700,454, Cl. 437-24.000.

Ting, Raymond M. L. Side joint of composite metal panel. 4,700,520, Cl. 52-478.000.

Tipton, Russell C.: *See*—
Dutton, Edmund L.; Selfridge, Glenn D.; and Tipton, Russell C., 4,701,415, Cl. 435-289.000.

Tirpak, Robin E.: *See*—
Markusch, Peter H.; Rosthauser, James W.; and Tirpak, Robin E., 4,701,480, Cl. 523-340.000.

Toba, Hiroto: *See*—
Masaki, Takeshi; Kawata, Koichi; Sakagaito, Yukuo; Yamaguchi, Katsumasa; Kinoshiro, Hiromichi; and Toba, Hiroto, 4,701,591, Cl. 219-121.0LT.

Toepert, Michael: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; Wiechert, Rudolf; Toepert, Michael; and Wendt, Hans, 4,701,451, Cl. 514-180.000.

Tokai Sogo Sekkei Kabushiki Kaisha: *See*—
Katsuno, Hiroshi, 4,700,932, Cl. 267-136.000.

Tokico Ltd.: *See*—
Sakurai, Hiroshi, 4,701,823, Cl. 360-106.000.

Tokita, Yasuhiro: *See*—
Fuke, Akira; Tokita, Yasuhiro; and Masuda, Katsuhiko, 4,701,925, Cl. 372-38.000.

Tokuda, Ryuji; Harunari, Yoshihiro; and Kobe, Takashi, to Canon Kabushiki Kaisha. Input circuit for distance measuring apparatus. 4,701,048, Cl. 356-1.000.

Tokyo Electric Co., Ltd.: *See*—
Tajima, Noriyasu; Sakura, Yasuhiro; Futakata, Takashi; Senda, Kouji; and Seki, Kazuaki, 4,700,792, Cl. 177-178.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ikenaga, Osamu, 4,701,053, Cl. 356-375.000.
Suzuki, Kouji; Ikeda, Mitsushi; and Aoki, Toshio, 4,700,458, Cl. 437-83.000.
Suzuki, Yoshio, 4,701,665, Cl. 313-402.000.

Tollerud, Bruce A.; and Tollerud, Carol R. Nursing pad. 4,700,699, Cl. 128-156.000.

Tollerud, Carol R.: *See*—
Tollerud, Bruce A.; and Tollerud, Carol R., 4,700,699, Cl. 128-156.000.

Tom-Kap-Co: *See*—
Nettel, Hans, 4,701,089, Cl. 411-373.000.

Tomar Electronics, Inc.: *See*—
Sikora, Scott T., 4,701,672, Cl. 315-241.00S.

Tomii, Yuji: *See*—
Morimoto, Teruyo; Sano, Yumiko; Nimura, Eiji; Tomii, Yuji; and Maeda, Tatsuo, 4,701,389, Cl. 430-110.000.

Tomikawa, Inao: *See*—
Watanabe, Takashi; Tsuda, Nobuo; and Tomikawa, Inao, 4,701,613, Cl. 250-227.000.

Tomiyoshi, Kazutoshi: *See*—
Itoh, Kunio; Shiobara, Toshio; Futatsumori, Koji; Tomiyoshi, Kazutoshi; and Shimizu, Hisashi, 4,701,482, Cl. 523-435.000.
Shiobara, Toshio; and Tomiyoshi, Kazutoshi, 4,701,479, Cl. 523-220.000.

Topfl, Werner; and Pissiotas, Georg, to Ciba-Geigy Corporation. Herbicidal sulfonylureas. 4,701,206, Cl. 71-90.000.

Toray Industries, Inc.: *See*—
Koebisu, Mamoru; Nishioka, Takeshi; Kamijyukkoku, Nario; and Kawano, Hirosi, 4,701,472, Cl. 521-50.500.
Yoshikawa, Seiichi; Yoshioka, Toshio; and Shimamura, Masaharu, 4,700,723, Cl. 131-334.000.

Tordeux, Marc: *See*—
Francese, Catherine; Tordeux, Marc; and Wakselman, Claude, 4,701,569, Cl. 568-812.000.

Torelli, Vesperto; Nedelec, Lucien; Moguilewski, Martine; and Moura, Anne-Marie, to Roussel Uclaf. Novel 10-substituted steroids and their use in the induction of aldosterone antagonistic activity. 4,701,449, Cl. 514-175.000.

Torigian, Puzant C., to Challenger Industries, Ltd. Method of treating lettuce and other leafy vegetable plants and products produced therefrom. 4,700,727, Cl. 131-369.000.

Torras, Robert M., to Kut Kwick Corporation. Mower with impact resistant connection. 4,700,536, Cl. 56-15.800.

Tosbac Computer System Co., Ltd.: *See*—
Ushiki, Hiroshi; and Iwasaki, Tetsuaki, 4,701,748, Cl. 340-365.00S.

Toshiba Silicone Company, Ltd.: *See*—
Sato, Norio, 4,701,503, Cl. 525-478.000.

Tosswill, Christopher H., to Galileo Electro-Optics Corp. Middle-infrared imaging device. 4,701,618, Cl. 250-330.000.

Tottori, Takeshi: *See*—
Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, 4,701,819, Cl. 360-122.000.

Townsend, David E.; Frye, Diane R.; Greene, Tammie B.; and Perfetti, Thomas A., to R. J. Reynolds Tobacco Company. Cigarette rods having segmented sections. 4,700,726, Cl. 131-364.000.

Toy, Wing N.: *See*—
Ransom, Maurice N.; and Toy, Wing N., 4,701,906, Cl. 370-60.000.

Toyama, Nobuo. Recorders. 4,700,606, Cl. 84-380.00C.

Toyama, Tadao: *See*—
Nagano, Teruo; Toyama, Tadao; and Nagashima, Akira, 4,701,399, Cl. 430-179.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Akiyama, Takashi; Hotta, Yasunari; and Oda, Naonobu, 4,701,372, Cl. 428-323.000.
Kurita, Kazuo; and Ishihara, Hideaki, 4,701,377, Cl. 428-364.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Kato, Nobuyuki; and Kobayashi, Akira, 4,701,295, Cl. 264-519.000.
Kitamura, Yoichi; Hotta, Hisashi; and Kodaira, Toshimasa, 4,701,354, Cl. 427-255.600.
Matsuo, Junichi; Sakano, Kozaburo; and Takeda, Isamu, 4,700,871, Cl. 222-107.000.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Hasegawa, Masazumi; Arai, Shoji; and Mizoe, Shinya, 4,701,473, Cl. 521-118.000.

Toyoda, Kenji; and Hishinuma, Toru, to Nippon Kogaku K.K. Image reading apparatus. 4,701,804, Cl. 358-280.000.

Toyoda Koki Kabushiki: *See*—
Namba, Yoshiharu; Suzuki, Hiroshi; and Sugita, Kazuhiko, 4,700,510, Cl. 51-134.50R.

Toyoda Koki Kabushiki Kaisha: *See*—
Tsujiuchi, Toshio; and Niino, Yasuo, 4,700,483, Cl. 33-125.00R.

Toyota Jidosha Kabushiki Kaisha: *See*—
Hanafusa, Tooru; Kinugasa, Yukio; and Yaegashi, Takehisa, 4,700,681, Cl. 123-478.000.
Iwata, Yasunari; and Usui, Hirokazu, 4,700,563, Cl. 73-118.100.
Kanda, Mutsumi; Okumura, Takeshi; and Iwashita, Yoshihiro, 4,700,665, Cl. 123-41.82R.
Kinaga, Eiichi; and Shiraishi, Daiichi, 4,700,983, Cl. 296-146.000.
Kinaga, Eiichi; and Shiraishi, Daiichi, 4,700,984, Cl. 296-146.000.
Kuroiwa, Yosio; and Sibata, Takuo, 4,701,085, Cl. 409-244.000.
Nishimura, Takumi; Saito, Tadao; Nakanishi, Nobuyasu; and Noguchi, Noboru, 4,700,991, Cl. 303-113.000.
Osanai, Akinori, 4,701,853, Cl. 364-424.100.
Ota, Isamu; Nishimura, Yutaka; Nishio, Shigeru; and Yogo, Kenji, 4,700,682, Cl. 123-516.000.
Sakurai, Kazuhiro; and Hattori, Kyo, 4,700,669, Cl. 123-188.00M.
Takeuchi, Hitoshi; and Ooishi, Shogo, 4,700,896, Cl. 239-693.000.
Tamaki, Shigenori; Machizuki, Hiroyuki; Kobayashi, Nobuo; Iwase, Takahiro; and Masuda, Naofumi, 4,701,346, Cl. 427-46.000.
Uranishi, Koji; Ito, Takaaki; and Tanahashi, Toshio, 4,701,198, Cl. 55-387.000.
Uranishi, Kouji; and Itou, Takaaki, 4,700,683, Cl. 123-519.000.
Yasue, Hideki; and Fukumura, Kagenori, 4,700,591, Cl. 74-868.000.

Trapp, Helmut, to Voest-Alpine Aktiengesellschaft. Device for conveying heaps of debris. 4,700,826, Cl. 198-550.120.

Trefethern, George M.; and Trefethern, Marian J. Propelled pontoon chair. 4,700,648, Cl. 114-61.000.

Trefethern, Marian J.: *See*—
Trefethern, George M.; and Trefethern, Marian J., 4,700,648, Cl. 114-61.000.

Tremblay, Remi. Concentration of silicon carbide. 4,700,898, Cl. 241-14.000.

Treybig, Duane S.: *See*—
Chang, Dane; and Treybig, Duane S., 4,701,484, Cl. 524-59.000.

Trillium Telephone Systems Inc.: *See*—
Molnar, Gerald, 4,701,948, Cl. 379-165.000.

Trimmer, William S. N.: *See*—
Gabriel, Kaigham J.; Trimmer, William S. N.; and Walker, James A., 4,700,541, Cl. 60-528.000.

Trini Castelli, Clino. Method of lighting environments in general, particularly open space environments. 4,701,831, Cl. 362-147.000.

Tripp, Harley A., to Shell Oil Company. Quality control for sucker rods. 4,700,577, Cl. 73-801.000.

TriStar Sports Inc.: *See*—
Meatto, Franklin D.; and Pilpel, Edward D., 4,700,967, Cl. 280-609.000.

Triune Automated Painting Systems: *See*—
O'Brien, Lawrence B., 4,700,830, Cl. 206-229.000.

Tromborg, Craig E.: *See*—
Flygstad, Dean W.; and Tromborg, Craig E., 4,701,640, Cl. 307-400.000.

Troxler Electronic Laboratories, Inc.: *See*—
Regimand, Ali, 4,701,868, Cl. 364-558.000.

Trudeau, Curtis A., to CMI Corporation. Seismic energy source. 4,700,804, Cl. 181-121.000.

Truitt, Robert E.: *See*—
Courtois, Peter D.; and Truitt, Robert E., 4,700,979, Cl. 294-89.000.

TRW Inc.: *See*—
Madeley, John N., 4,701,136, Cl. 439-76.000.

Trygg, Hannu: *See*—
Kuusela, Juhani; Lopperi, Esko; Lummila, Markku; Saksala, Pertti; Salovaara, Esa; Suhonen, Tuomo; Perttina, Harri; Poikolainen, Esko; and Trygg, Hannu, 4,700,953, Cl. 277-38.000.

Tsaur, Bor-Yeu: *See*—
Choi, Hong-Kyun; and Tsaur, Bor-Yeu, 4,700,461, Cl. 437-41.000.

Tsuda, Nobuo: *See*—
Watanabe, Takashi; Tsuda, Nobuo; and Tomikawa, Inao, 4,701,613, Cl. 250-227.000.

Tsuezuki, Yoshio: *See*—
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,701,392, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,701,393, Cl. 430-57.000.

Tsuge, Kazunori: *See*—
Tawada, Yoshihisa; and Tsuge, Kazunori, 4,701,344, Cl. 427-39.000.

Tsui, Cyrus: *See*—
Chan, Albert; Fitzpatrick, Mark; Goddard, Don; Bosnyak, Robert J.; and Tsui, Cyrus, 4,701,695, Cl. 324-510.000.

Tsuji, Jiro; and Takahashi, Takashi, to UBE Industries, Ltd. Novel 10-membered ring compound and process for preparing the same. 4,701,536, Cl. 549-215.000.

Tsujiuchi, Toshio; and Niino, Yasuo, to Toyoda Koki Kabushiki Kaisha. Position detection device for movable head. 4,700,483, Cl. 33-125.00R.

Tsutomu, Ikeda: *See*—
Susumu, Kubo; Tsutomu, Ikeda; Yoichi, Takanami; and Yoichi, Mikami, 4,701,522, Cl. 530-370.000.

Tsutsui, Yoshio: *See*—
Hirotsu, Tetsuji; Kiwaki, Hisakatsu; Nakamura, Kiyoshi; Narita, Hiroshi; Kasai, Syozi; Kimura, Akira; and Tsutsui, Yoshio, 4,701,682, Cl. 318-52.000.

Tubiana, Dominique: *See*—
Courjaret, Francois; Del Fabbro, Gilbert; Devic, Jean-Noel; Divoux, Michel; Forella, Guy; Hamant, Jean-Pierre; Tubiana, Dominique; and Pavie, Claude, 4,701,094, Cl. 414-330.000.

Tuchiya, Takanori: *See*—
Kuraoka, Koji; Umeda, Morio; Konishi, Takeshi; and Tuchiya, Takanori, 4,700,982, Cl. 296-107.000.

Tucker, Herbert D.: *See*—
Nieboer, Keith A.; and Tucker, Herbert D., 4,700,525, Cl. 52-698.000.

Tunnell, George W.: *See*—
Kaiser, Bruce J.; Walker, Edward S.; Tunnell, George W.; and Masaitis, William, 4,701,621, Cl. 250-435.000.

Tunnell, James H.: *See*—
Bernhagen, James R.; Crabb, Elmer R.; Murphy, Marilyn S.; Roley, Daniel G.; St. Germain, Gene R.; and Tunnell, James H., 4,700,794, Cl. 180-6.440.

Tupker, Hermann: *See*—
Achelpohl, Fritz; Winkler, Gerhard; Tupker, Hermann; and Linkies, Jurgen, 4,701,116, Cl. 425-72.00R.

Turbe, Jean-Pierre, to Matix Industries. Ultrasonic detection method of the internal defects of a railroad track rail located in the sides of the head of said rail and device to carry it out. 4,700,574, Cl. 73-636.000.

Turbe, Jean-Pierre: *See*—
Prasil, Bernard; and Turbe, Jean-Pierre, 4,700,564, Cl. 73-146.000.

Turczanski, Henry: *See*—
Hill, John; Bannister, Royston W.; and Turczanski, Henry, 4,701,735, Cl. 335-282.000.

Turner, Robert B., to Dow Chemical Company, The. Polyurethanes reinforced with rigid rod micro fillers. 4,701,475, Cl. 521-137.000.

Tuten, James M.: *See*—
Harrison, Harold D.; and Tuten, James M., 4,701,866, Cl. 364-550.000.

Tzeng, J. C.: *See*—
Baerg, William; Ting, Chiu H.; Siu, Byron B.; and Tzeng, J. C., 4,700,454, Cl. 437-24.000.

U.C.P.I. Societe pour l'Utilisation des Ceramiques et des Platres dans l'Industrie: *See*—
Broihanne, Georges; and Magnier, Pierre, 4,700,768, Cl. 164-361.000.

Ube Industries, Ltd.: *See*—
Kobayashi, Waichi; Akegi, Seiji; and Iwata, Kazuhiro, 4,701,222, Cl. 106-288.00B.
Tsuji, Jiro; and Takahashi, Takashi, 4,701,536, Cl. 549-215.000.

Uchida, Akihisa: *See*—
Okada, Daisuke; Uchida, Akihisa; Takakura, Toshihiko; Nakashima, Shinji; Ohno, Nobuhiko; and Ogiue, Katsumi, 4,700,464, Cl. 437-67.000.

Uchikawa, Fusaoki: *See*—
Tanaka, Hideharu; Sekiya, Mutsuo; and Uchikawa, Fusaoki, 4,700,805, Cl. 181-265.000.

Uchino, Kazuyoshi; and Nikaido, Masaya, to Jidosha Kiki Co., Ltd. Flow control valve. 4,700,733, Cl. 137-117.000.

Uchtman, Vernon A.: *See*—
Dixon, Thomas J.; and Uchtman, Vernon A., 4,701,322, Cl. 424-70.000.

Ueda, Chikai: *See*—
Yamauchi, Kouji; and Ueda, Chikai, 4,701,091, Cl. 414-70.000.

Ueda, Sigei; Matsumoto, Kozo; Kanaiwa, Kiyoshi; and Adachi, Muneo, to Canon Kabushiki Kaisha. Device for converting code signals of one bit number into a code signal of a smaller bit number. 4,701,746, Cl. 340-347.0DD.

Ueda, Yasuo; Kagitani, Yoshio; Komeda, Shirou; and Funakoshi, Satoshi, to Green Cross Corporation, The. Injectable aqueous solution containing hydrogensulfite and/or sulfite and anticancerous benzodiazepine compound. 4,701,325, Cl. 424-164.000.

Uehara, Hidehiko, to Sanshin Kogyo Kabushiki Kaisha. Propeller damping arrangement for marine propulsion device. 4,701,151, Cl. 464-89.000.

Uemura, Takashi: *See*—
Hattori, Hiroyuki; Uemura, Takashi; and Yamauchi, Toshio, 4,701,305, Cl. 422-73.000.

Uemura, Yasuhiro, to Teac Corp. & Nippon Landex Ltd. Loading and ejecting mechanism for a magnetic tape cassette apparatus. 4,701,817, Cl. 360-96.500.

Uhlig, Georg: *See*—
Kollner, Harald; and Uhlig, Georg, 4,700,508, Cl. 49-352.000.

Ukai, Yujiro: *See*—
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Ulveland, Stefan, to AB Volvo. Method and device for signaling that gear change is required. 4,701,852, Cl. 364-424.100.

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Umeki, Yoshihiko: *See*—
Akihama, Shigeyuki; Saito, Makoto; Kawamoto, Akio; Banno, Tadashi; Umeki, Yoshihiko; and Nakamura, Takumi, 4,700,518, Cl. 52-309.160.

Umemura, Shinichiro: *See*—
Kato, Noboru; Matsuura, Hideji; and Umemura, Shinichiro, 4,701,830, Cl. 361-395.000.

Umetco Minerals Corporation: *See*—
Ramachandran, Sundaresan; Skiles, David O.; and Hansen, Donald J., 4,701,309, Cl. 423-20.000.

Umezawa, Iwao: *See*—
Komiyama, Kanki; Funayama, Shinji; and Umezawa, Iwao, 4,701,324, Cl. 424-118.000.

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Unie van Kunstmestfabrieken B.V.: *See*—
Mutsers, Stanislaus M. P.; and Craenen, Gerardus S. P. M., 4,701,353, Cl. 427-213.000.

Union Carbide Corporation: *See*—
Bailey, Frederick E., Jr.; and Argento, Benny J., 4,701,474, Cl. 521-137.000.
Braun, David B., 4,701,264, Cl. 210-734.000.
Fisher, Theodore F.; Hanson, Thomas C.; and Weber, Joseph A., 4,701,200, Cl. 62-27.000.
Hanson, Thomas C.; Fisher, Theodore F.; Weber, Joseph A.; and Pahade, Ravindra F., 4,701,201, Cl. 62-27.000.
Olson, Kurt D., 4,701,562, Cl. 568-390.000.
Soo, Hwaili; and Robson, John H., 4,701,571, Cl. 568-867.000.
Williams, Thomas C., 4,701,488, Cl. 524-266.000.

Union Oil Company of California: *See*—
Croudace, Michael C.; Mendelson, Leah T.; and Holstedt, Richard A., 4,701,274, Cl. 252-46.300.
Young, Donald C.; and Green, James A., II, 4,701,555, Cl. 564-38.000.
Unisearch Limited: *See*—
Szirmai, Stephen G.; Newman, Gerard R.; and Kelly, Philip L., 4,701,941, Cl. 378-122.000.
Unisys Corporation: *See*—
Andreasen, David A.; Buggert, Jerrold E.; Desai, Harshad K.; and Hussain, Zubair, 4,701,845, Cl. 364-200.000.
United Foam Plastics Corp.: *See*—
Champ, David M., 4,700,832, Cl. 206-320.000.
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Air Force: *See*—
Kitchens, Judith F.; Culp, Carl H., Sr.; Hyde, Raymond G.; and Brownlee, Shirley G., 4,701,125, Cl. 432-1.000.
Williams, Donald E., 4,700,763, Cl. 152-417.000.
Army: *See*—
Campagnulo, Carl J.; and Benderly, Asaf A., 4,701,835, Cl. 362-192.000.
Leupold, Herbert A., 4,701,737, Cl. 335-301.000.
Energy: *See*—
Benson, David A.; and Kuswa, Glenn W., 4,700,629, Cl. 102-201.000.
Filippi, Arthur M.; and Sprecace, Richard P., 4,700,863, Cl. 220-67.000.
Pearson, Richard K.; Bystroff, Roman I.; and Miller, Dale E., 4,701,379, Cl. 428-427.000.
Interior: *See*—
Seeley, Robert L.; Barth, Joseph J.; and Clayton, Gerald H., II, 4,701,712, Cl. 324-340.000.
U.S. Philips Corporation: *See*—
Barnes, Harold E., 4,701,749, Cl. 340-384.00R.
Beasley, James P., 4,701,623, Cl. 250-492.200.
Duvent, Jean-Louis, 4,701,782, Cl. 358-227.000.
Einhaus, Hermanus F., 4,701,903, Cl. 369-216.000.
Froling, Melchert H.; and Schmitz, Herman J. R., 4,701,794, Cl. 358-147.000.
Kringe, Horst, 4,700,754, Cl. 141-95.000.
Lentfer, Arno; and Luthje, Holger, 4,701,391, Cl. 430-5.000.
Muller, Johannes C. A., 4,701,821, Cl. 360-130.240.
Peek, Hermanus L., 4,700,459, Cl. 437-53.000.
Vieilledent, Gerard, 4,701,236, Cl. 156-252.000.
United Technologies Automotive, Inc.: *See*—
Wodnicki, Glen G.; and Czarnecki, Carl, 4,701,581, Cl. 200-52.00R.
United Technologies Corporation: *See*—
Cantor, Eugene; and Farrand, Thomas A., 4,701,105, Cl. 416-95.000.
Fucci, Robert C., 4,700,544, Cl. 60-757.000.
Ringermacher, Harry I.; and Williams, Richard S., 4,701,658, Cl. 310-334.000.
Ryan, Edward J., 4,700,881, Cl. 228-194.000.
University of Birmingham: *See*—
Warner, Noel A., 4,701,217, Cl. 75-92.000.
University of California, The Regents of the: *See*—
White, Mark W., 4,701,953, Cl. 381-46.000.
University of Florida: *See*—
Kalra, Satya P., 4,701,441, Cl. 514-12.000.
University of Melbourne, The: *See*—
Harvey, Kaye F.; Johns, Reginald B.; Buchanan, Alan S.; and Cain, David A., 4,701,184, Cl. 44-10.00D.
University of Minnesota, Regents of the: *See*—
Samuelson, John P.; and Quast, Douglas A., 4,700,730, Cl. 135-67.000.
University of Newcastle Upon Tyne, The: *See*—
Jack, Kenneth H., 4,701,381, Cl. 428-548.000.
Unland, Stefan: *See*—
Bonitz, Jorg; Entenmann, Robert; Miller, Bernhard; Rauch, Hans; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, 4,700,677, Cl. 123-425.000.
Uno, Kiyotaka: *See*—
Kondo, Kiyoshi; Kataoka, Fukuhiko; and Uno, Kiyotaka, 4,700,817, Cl. 188-380.000.
UOP Inc.: *See*—
Greenwood, Arthur R., 4,701,429, Cl. 502-37.000.
Upjohn Company, The: *See*—
Heckler, Jay W., 4,701,470, Cl. 514-570.000.
Ura, Syouzabu; Kikuchi, Tsutomu; and Yasuda, Makoto, to Nissan Motor Co., Ltd. Induction system for internal combustion engine. 4,700,666, Cl. 123-52.0MB.
Uranishi, Koji; Ito, Takaaki; and Tanahashi, Toshio, to Toyota Jidosha Kabushiki Kaisha. Fuel tank for use in a motor vehicle. 4,701,198, Cl. 55-387.000.
Uranishi, Kouji; and Itou, Takaaki, to Toyota Jidosha Kabushiki Kaisha. Device for purging evaporated fuel captured by a charcoal canister. 4,700,683, Cl. 123-519.000.
Urban Transportation Development Corporation, Ltd.: *See*—
Chadwick, Dennis, 4,700,854, Cl. 213-62.00R.
Urquhart, Robert J.: *See*—
Bass, Vance R.; Bonebrake, Veronica A.; Garrison, David A.; Landis, James K.; Neff, Mary S.; Urquhart, Robert J.; and Williams, Susan C., 4,701,851, Cl. 364-419.000.
Ushiki, Hiroshi; and Iwasaki, Tetsuaki, to Kabushiki Kaisha Toshiba; and Tosbac Computer System Co., Ltd. Key circuit. 4,701,748, Cl. 340-365.00S.
Usuda, Tsuneo: *See*—
Kawaguchi, Toshiyuki; Suzuki, Hideki; and Usuda, Tsuneo, 4,701,279, Cl. 252-511.000.
Usui, Akira: *See*—
Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, 4,701,819, Cl. 360-122.000.
Usui, Hirokazu: *See*—
Iwata, Yasunari; and Usui, Hirokazu, 4,700,563, Cl. 73-118.100.
Usui, Shiro: *See*—
Akai, Takashi; Okamoto, Katsuro; and Usui, Shiro, 4,701,874, Cl. 364-724.000.
USV Pharmaceutical Corporation: *See*—
Suh, John T.; and Barton, Jeffrey N., 4,701,461, Cl. 514-317.000.
Utaka, Katsuyuki: *See*—
Akiba, Shigeyuki; Utaka, Katsuyuki; Sakai, Kazuo; and Matsushima, Yuichi, 4,701,930, Cl. 372-96.000.
Utex Industries, Inc.: *See*—
Pippert, Aaron J., 4,700,503, Cl. 43-42.090.
Uto, Sachio: *See*—
Oshida, Yoshitada; Shiba, Masataka; Nakashima, Naoto; Nakata, Toshihiko; and Uto, Sachio, 4,701,050, Cl. 356-152.000.
Utsumi, Isao, to Fuji Photo Film Co., Ltd. Stimulable phosphor sheet conveyance apparatus. 4,701,617, Cl. 250-327.200.
Vacanti, Eugene J., to Sports Marketing, Inc. Protective cushion. 4,700,403, Cl. 2-2.000.
Vajtay, Laselo, deceased (by Vajtay, Stephen M., executor), to SLM Corporation. Tubular package and end cap forming component of same. 4,700,883, Cl. 229-125.170.
Vajtay, Stephen M., executor: *See*—
Vajtay, Laselo, deceased, 4,700,883, Cl. 229-125.170.
Valenty, Vivian B., to General Electric Company. Method of making diglyme soluble siloxane-imide copolymers. 4,701,511, Cl. 528-26.000.
Vallourec: *See*—
Grare, Didier; and Salkin, Herve, 4,700,576, Cl. 73-761.000.
Valyi, Emery I., to Husky Injection Molding Systems Ltd. Method for pressure molding objects of different resins. 4,701,292, Cl. 264-255.000.
van Aalst, Gerhardt, to Cyclonaire Bulk Cargo Systems, Inc. Transfer system for dry flowable material. 4,701,080, Cl. 406-109.000.
van Bonn, Rolf: *See*—
Eschwey, Manfred; and van Bonn, Rolf, 4,701,290, Cl. 264-40.100.
van der Heijden, Arnoldus: *See*—
Doornbos, Tamme; van der Heijden, Arnoldus; van der Kamp, Johannes W.; and de Rooij, Johannes F., 4,701,335, Cl. 426-533.000.
van der Kamp, Johannes W.: *See*—
Doornbos, Tamme; van der Heijden, Arnoldus; van der Kamp, Johannes W.; and de Rooij, Johannes F., 4,701,335, Cl. 426-533.000.
van Dijken, Johannes; and Scheffers, Alexander. Method for producing ethanol from xylose-containing substance. 4,701,414, Cl. 435-163.000.
Van Erden, Donald L., to Minigrip, Inc. Tubular film with transverse closure strips. 4,701,361, Cl. 428-36.000.
van Reijendam, Jan W.: *See*—
Mason, Ronald F.; Scholes, Gary; and van Reijendam, Jan W., 4,701,534, Cl. 548-950.000.
VanSant, Glen J., to RCA Corporation. Magnetic biasing apparatus for magneto-optic recording including a permanent magnet. 4,701,895, Cl. 369-13.000.
Vardanian, Armenak M.: *See*—
Martyshenko, Jury P.; Martyshenko, Sergei J.; Kotelnikov, Jury S.; Kutukhtin, Evgeny G.; Ilyasova, Nelli I.; Volkov, Jury S.; Vardanian, Armenak M.; and Petrosian, Misha S., 4,701,075, Cl. 405-217.000.
Varga, Andre; and Cripps, Henry, to Carding Specialists Ltd. Method and apparatus for handling a sliver. 4,700,538, Cl. 57-90.000.
Vari-Lite, Inc.: *See*—
Bornhorst, James M., 4,701,833, Cl. 362-299.000.
Varmo, Kjell O., to A/S Raufoss Ammunisjonsfabrikker A/S. Smoke grenade. 4,700,628, Cl. 102-33.400.
Vashi, Dhiru B.; Clark, Jeffrey N.; and Lindo, Neil A., to Schering Corporation. N-((2-nitro)phenyl)-N' (organic acid) guanidine anthelmintics. 4,701,447, Cl. 514-85.000.
Vasile, Anthony J. Square level measuring tool. 4,700,489, Cl. 33-342.000.
VDO Adolf Schindling AG: *See*—
Bruggemann, Ulrich, 4,701,867, Cl. 364-550.000.
Veb Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Schuck, Helmut; Foerster, Karl-Heinz; Kuehn, Monika; and Schanze, Klaus, 4,701,757, Cl. 340-825.060.
Velasco, Vicente S. Device to obtain ring-shaped cavities in the bottom of drilled holes made in any type of medium. 4,700,789, Cl. 175-202.000.
Velo Bind Inc.: *See*—
Simon, Gary J., 4,700,601, Cl. 83-687.000.
Velsher, Benne: *See*—
Hvezda, Jaroslav M.; Velsher, Benne; and Middlehurst, Richard J., 4,700,998, Cl. 439-325.000.
Velthuis, Otto M.: *See*—
Boxhoorn, Gosse; Klazinga, Aan H.; and Velthuis, Otto M., 4,701,437, Cl. 502-348.000.
Venturello, Carlo; Alneri, Enzo; Coassolo, Alfredo; and D'Aloisio, Rino, to Istituto Guido Donegani S.p.A. Process for preparing alkyl esters of methyltartronic acid. 4,701,550, Cl. 560-180.000.

Vere, Bernard; and Mathevon, Paul, to Societe Cogema, Framatome et Uranium Pechiney. Manufacturing installation with several fixed work posts and a handling device. 4,700,824, Cl. 198-346.200.
Verheul, Hermanus A. M.: *See*—
Kelder, Jan; and Verheul, Hermanus A. M., 4,701,450, Cl. 514-177.000.
Verhoeven, Laurentius M., to Du Pont de Nemours, E. I., and Company. Connector for a coaxial cable. 4,701,001, Cl. 439-394.000.
Veronese, Giuseppe: *See*—
Baradel, Agostino; Guerriero, Renato; and Veronese, Giuseppe, 4,701,311, Cl. 423-87.000.
Vetco Gray, Inc.: *See*—
Nelson, John E.; and Smith, Raymond J., 4,700,924, Cl. 251-58.000.
Vial, Christian: *See*—
Naef, Ferdinand; and Vial, Christian, 4,701,543, Cl. 549-458.000.
Victor Company of Japan, Ltd.: *See*—
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,701,872, Cl. 364-718.000.
Vieilledent, Gerard, to U.S. Philips Corporation. Method of manufacturing an electronic identification card. 4,701,236, Cl. 156-252.000.
Viess, Walter: *See*—
Bonitz, Jorg; Entenmann, Robert; Miller, Bernhard; Rauch, Hans; Rohde, Siegfried; Unland, Stefan; and Viess, Walter, 4,700,677, Cl. 123-425.000.
Vinn, Charles L.: *See*—
Harris, David J.; and Vinn, Charles L., 4,701,641, Cl. 307-445.000.
Viola, Marian: *See*—
Seidel, Raymond L.; and Viola, Marian, 4,701,684, Cl. 318-282.000.
Visa International Service Association: *See*—
Francini, Joseph P.; Asbo, Einar L.; and Boston, Vincent, 4,701,601, Cl. 235-449.000.
Vivenzio, Robert L.: *See*—
Lia, Raymond A.; and Vivenzio, Robert L., 4,700,693, Cl. 128-4.000.
Vock, Manfred H.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Miller, Kevin P.; and Wiener, Charles, 4,701,548, Cl. 560-152.000.
Voest-Alpine Aktiengesellschaft: *See*—
Trapp, Helmut, 4,700,826, Cl. 198-550.120.
Vogt, Frederich H.; Bunk, Stanley A.; and D'Acierno, John P., to Dorr-Oliver Incorporated. Ash classifier. 4,700,636, Cl. 110-165.00A.
Volk, Thomas G.; and Jaycox, Donald F., to Northern Telecom Limited. High density connector for main frames in telephone systems. 4,701,135, Cl. 439-54.000.
Volkhin, Nikolai N.; Ardabatsky, Vladimir P.; and Luzin, Valery V., to Vsesojuzny Nauchnoisledovatelsky Proektno-Konstruktorsky I Tekhnologichesky Akkumulyatorny Institut. Method of assembling a cylindrical storage battery. 4,700,468, Cl. 29-623.200.
Volkov, Jury S.: *See*—
Martyshenko, Jury P.; Martyshenko, Sergei J.; Kotelnikov, Jury S.; Kutukhtin, Evgeny G.; Ilyasova, Nelli I.; Volkov, Jury S.; Vardanian, Armenak M.; and Petrosian, Misha S., 4,701,075, Cl. 405-217.000.
Volpato, Alberto. Device apt to permit skiing on snowless ground. 4,700,958, Cl. 280-11.1BT.
von der Eltz, Hans-Ulrich; Maier, Hans-Peter; and Rostermundt, Karl-Heinz. Pad cold-dwell process for dyeing wool piece goods with reactive dyes under acid pH. 4,701,182, Cl. 8-533.000.
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Volkhin, Nikolai N.; Ardabatsky, Vladimir P.; and Luzin, Valery V., 4,700,468, Cl. 29-623.200.
Vulcan-Hart Corporation: *See*—
Scanlon, John M., 4,700,619, Cl. 99-349.000.
W. R. Grace & Co.: *See*—
Kreh, Robert P., 4,701,245, Cl. 204-78.000.
Lin, Shiow C., 4,701,513, Cl. 528-89.000.
Wachholz, Winfried: *See*—
Schoening, Josef; Wachholz, Winfried; and Weicht, Ulrich, 4,701,298, Cl. 376-273.000.
Wacker-Chemie GmbH: *See*—
Burkhardt, Jurgen; and Rauchberger, Werner, 4,701,490, Cl. 524-425.000.
Wada, Toshio; and Hirano, Tatsuo, to Junkosha Co., Ltd. Electrical transmission line. 4,701,576, Cl. 174-117.00F.
Wade, Darrel E., Sr.; and Spector, George. Protective visor for door handles. 4,700,556, Cl. 70-455.000.
Wagatsuma, Kikuji: *See*—
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,701,872, Cl. 364-718.000.
Wagner, Leonard A. Combination wine rack and glass retention/dispensing assembly. 4,700,849, Cl. 211-71.000.
Wakabayashi, Seiichi: *See*—
Yamanashi, Hidenori; Inada, Toshio; and Wakabayashi, Seiichi, 4,701,652, Cl. 313-51.000.
Wakselman, Claude: *See*—
Francese, Catherine; Tordeux, Marc; and Wakselman, Claude, 4,701,569, Cl. 568-812.000.
Walker, Christopher J. J.: *See*—
Crossland, William A.; Walker, Christopher J. J.; and Davey, Anthony B., 4,701,029, Cl. 350-351.000.
Walker, Edward S.: *See*—
Kaiser, Bruce J.; Walker, Edward S.; Tunnell, George W.; and Masaitis, William, 4,701,621, Cl. 250-435.000.
Walker, Fritz: *See*—
Goller, Ernst; and Walker, Fritz, 4,700,553, Cl. 66-146.00R.
Walker, James A.: *See*—
Gabriel, Kaigham J.; Trimmer, William S. N.; and Walker, James A., 4,700,541, Cl. 60-528.000.
Walsh, George A.: *See*—
Allebest, Edward F.; Hansen, Parley E.; Walsh, George A.; and Maguire, Walter R., 4,701,896, Cl. 369-32.000.
Walter, Lee: *See*—
Ovshinsky, Stanford R.; Allred, David D.; Walter, Lee; and Hudgens, Stephen J., 4,701,343, Cl. 427-39.000.
Walter, Siegfried: *See*—
Hermann, Dietmar; and Walter, Siegfried, 4,701,376, Cl. 428-358.000.
Walters, Paul W.; and Benslay, Roger M., to Ashland Oil, Inc. Vented riser. 4,701,307, Cl. 422-147.000.
Wan, Shyue-Yun; Guo, Jeng-Joung; and Lin, Cheng-Fung, to Industrial Technology Research Institute Republic of China. Signal storage and replay system. 4,701,937, Cl. 375-25.000.
Wang, John S., to International Business Machines Corp. Mirror inverse function in an interactive graphics system. 4,701,752, Cl. 340-723.000.
Wang, Lin-Shu. Internal combustion engines and methods of operation. 4,700,542, Cl. 60-598.000.
Wang, Taylor G.; Elleman, Daniel D.; Lee, Mark C.; and Kendall, James M., Jr., to California Institute of Technology. Catalytic, hollow, refractory spheres. 4,701,436, Cl. 502-339.000.
Wankel GmbH, Firma: *See*—
Mitsumoto, Takashi; Eiermann, Dankwart; and Nuber, Roland, 4,700,740, Cl. 137-512.150.
Ward, Steven M.: *See*—
Stokes, John H.; Clark, John I.; Morris, James D.; and Ward, Steven M., 4,701,858, Cl. 364-483.000.
Wardlaw, Stephen C.: *See*—
Levine, Robert A.; and Wardlaw, Stephen C., 4,700,715, Cl. 128-774.000.
Warner, Arthur W.; and Goldfrank, Bruce, to Frequency Electronics, Inc. Piezoelectric resonators having a lateral field excited SC cut quartz crystal element. 4,701,661, Cl. 310-360.000.
Warner-Lambert Company: *See*—
Dewald, Horace A.; Wise, Lawrence D.; and Heffner, Thomas G., 4,701,456, Cl. 514-253.000.
Eoga, Anthony B. J., 4,701,223, Cl. 134-2.000.
Sircar, Ila; and Bristol, James A., 4,701,453, Cl. 514-222.000.
Warner, Noel A., to University of Birmingham. Smelting reduction. 4,701,217, Cl. 75-92.000.
Wartelle, Claude, to Centre Techniques des Industries Mecaniques. Proportional hydraulic distributor. 4,700,747, Cl. 137-625.230.
Washington State University Research Foundation, Inc.: *See*—
Matteson, Donald S., 4,701,545, Cl. 558-298.000.
Washizuka, Isamu; Nishimura, Kosuke; and Saiji, Mitsuhiro, to Sharp Kabushiki Kaisha. Audio output device with speech synthesis technique. 4,701,862, Cl. 364-513.500.
Watanabe, Hiroshi; and Shimizu, Yukihiko, to Futaba Denshi Kogyo Kabushiki Kaisha. Optical write device. 4,701,670, Cl. 315-169.300.
Watanabe, Hiroyuki; and Rikumaru, Hiroshi, to Asahi Medical Co., Ltd. Method for removing leukocytes. 4,701,267, Cl. 210-806.000.
Watanabe, Masakazu: *See*—
Okuno, Akiyasu; and Watanabe, Masakazu, 4,701,426, Cl. 501-90.000.
Watanabe, Takashi; Tsuda, Nobuo; and Tomikawa, Inao, to Nippondenso Co., Ltd. Electro-optical rain detector for windshields. 4,701,613, Cl. 250-227.000.
Watanabe, Tokumi: *See*—
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,701,872, Cl. 364-718.000.
Watanabe, Yoshihiko: *See*—
Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, 4,701,902, Cl. 369-77.100.
Waterworth, John R., to Ferranti, plc. Data compression system. 4,701,745, Cl. 340-347.0DD.
Watson, Edwin G., to RCA Corporation. Magnetic biasing apparatus for magneto-optic recording including a magnetic circuit. 4,701,894, Cl. 369-13.000.
Watson, Francis M.: *See*—
Head, W. John; and Watson, Francis M., 4,701,669, Cl. 315-155.000.
Watson, James H. P.: *See*—
Gibbs, Dudley F.; Greenhalgh, Marilyn E.; Watson, James H. P.; Yeo, Richard G.; and Ellwood, Derek C., 4,701,261, Cl. 210-606.000.
Weatherford, Wayne M.: *See*—
Nelson, Catherine E.; Crowley, Dennis E.; and Weatherford, Wayne M., 4,701,329, Cl. 426-74.000.
Weaver, Max A.; Moore, William H.; and Lum, Kin K., to Eastman Kodak Company. Yellow dye-donor element used in thermal dye transfer. 4,701,439, Cl. 503-227.000.
Webasto-Werk W. Baier GmbH & Co.: *See*—
Lucius, Werner; Mosig, Ernst; and Riedmaier, Josef, 4,700,889, Cl. 237-12.30C.

Weber, Joseph A.: *See—*
Fisher, Theodore F.; Hanson, Thomas C.; and Weber, Joseph A., 4,701,200, Cl. 62-27.000.
Hanson, Thomas C.; Fisher, Theodore F.; Weber, Joseph A.; and Pahade, Ravindra F., 4,701,201, Cl. 62-27.000.
Weber, Russell W. Line release on trolling device. 4,700,505, Cl. 43-43.120.
Wedel, Gregory L.; Fosler, Robert C.; and Garvin, Stanley P., Jr., to Beloit Corp. Dryer differential pressure controller. 4,700,493, Cl. 34-48.000.
Wedemeyer, Karlfried: *See—*
Dicke, Hans-Rudolf; Bottenbruch, Ludwig; Wedemeyer, Karlfried; Paetz, Klaus-Christian; and El Sayed, Aziz, 4,701,515, Cl. 528-176.000.
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Schoening, Josef; Wachholz, Winfried; and Weicht, Ulrich, 4,701,298, Cl. 376-273.000.
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Lia, Raymond A.; and Vivenzio, Robert L., 4,700,693, Cl. 128-4.000.
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Petrovic, Ljubisa M., 4,700,776, Cl. 166-157.000.
Welsh, Lawrence B.: *See—*
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Westgate, Charles A., to Gentex Corporation. Pneumatic adjustment means for earcups in helmets. 4,700,410, Cl. 2-423.000.
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Glover, Steven L., 4,700,880, Cl. 228-180.100.
Pekarek, William R., 4,701,297, Cl. 376-260.000.
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Martin, William J.; and Chun, John M., 4,700,429, Cl. 15-377.000.
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Goodrich, Gerald O.; Tehranian, Michael M.; and White, Donald A., 4,701,841, Cl. 364-200.000.
White, Mark W., to University of California, The Regents of the. Signal compression system. 4,701,953, Cl. 381-46.000.
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Braun, Alan J.; Smith, Lawrence M.; and Wildman, Kelvin H., 4,701,597, Cl. 219-521.000.
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Willard, Reginald A.; and Percival, William S., to National Research Development Corporation. Nuclear magnetic resonance apparatus with switched attenuator. 4,701,711, Cl. 324-322.000.
Willi Studer AG: *See—*
Schmid, Johann J., 4,700,712, Cl. 128-699.000.
Williams, Clarence O., to Happy Jack, Inc. Flea trap. 4,700,506, Cl. 43-113.000.
Williams, Donald E., to United States of America, Air Force. Remotely controlled aircraft tire inflation/deflation valve. 4,700,763, Cl. 152-417.000.
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August, Melvin C.; Bowen, Stephen A.; and Williams, John T., 4,700,996, Cl. 439-268.000.
Williams, Richard S.: *See—*
Ringermacher, Harry I.; and Williams, Richard S., 4,701,658, Cl. 310-334.000.
Williams, Susan C.: *See—*
Bass, Vance R.; Bonebrake, Veronica A.; Garrison, David A.; Landis, James K.; Neff, Mary S.; Urquhart, Robert J.; and Williams, Susan C., 4,701,851, Cl. 364-419.000.
Williams, Thomas C., to Union Carbide Corporation. Aminoorganopolysiloxane compositions with improved combustion resistance. 4,701,488, Cl. 524-266.000.
Willis, Donald H., to RCA Corporation. Frame comb filter having freeze frame feature. 4,701,785, Cl. 358-31.000.
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Hall, Stephen G., 4,701,074, Cl. 405-169.000.
Winckler, Peter S., to Eaton Corporation. Clutch with pyrolytic carbon friction material. 4,700,823, Cl. 192-107.00M.
Windmere Corporation: *See—*
Thaler, Arnold, 4,700,729, Cl. 134-139.000.
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De Lott, Stuart C., 4,700,409, Cl. 2-94.000.

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Achelpohl, Fritz; Winkler, Gerhard; Tupker, Hermann; and Linkies, Jurgen, 4,701,116, Cl. 425-72.00R.

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Wisniewski, Paul; and Golla, Franz, to Gewerkschaft Eisenhutte Westfalia GmbH. Mobile apparatus for cleaning remnants of carbon anode blocks. 4,701,249, Cl. 204-279.000.

Wissman, Jack L., to Duriron Company, Inc., The. Process of isostatic molding and bonding fluoropolymers. 4,701,291, Cl. 264-248.000.

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Schierling, Roland; Geyer, Werner; Wissmann, Michael; and Nickel, Hans, 4,700,668, Cl. 123-73.00C.

Wistar Institute, The: *See—*
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Witucki, Edward F.: *See—*
Frankel, Milton B.; and Witucki, Edward F., 4,701,557, Cl. 564-110.000.

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Wolf, Peter G.: *See—*
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Wong, Joseph S., to General Dynamics, Pomona Division. Stripline tapped-line hairpin filter. 4,701,727, Cl. 333-204.000.

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Woo, Ricky A., to Procter & Gamble Company, The. Toothpaste compositions. 4,701,319, Cl. 424-52.000.

Wood, Kenneth W.: *See—*
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Wortel, Theodorus M., to Exxon Research & Engineering Co. Zeolite L and process for its preparation. 4,701,315, Cl. 423-328.000.

Worth, Sidney V., to Continental-Wirt Electronics Corporation. Hermaphroditic connector. 4,701,133, Cl. 439-13.000.

Wrathall, Robert S.; and Sutor, Judy L., to Motorola Inc. CMOS high gain amplifier utilizing positive feedback. 4,701,718, Cl. 330-253.000.

Wrathall, Robert S.; and McLaughlin, Kevin L., to Motorola Inc. ECL/CMOS memory cell with separate read and write bit lines. 4,701,883, Cl. 365-154.000.

Wright, John J.: *See—*
Meanwell, Nicholas A.; and Wright, John J., 4,701,459, Cl. 514-293.000.

Wright Line, Incorporated: *See—*
Beam, John W.; and Paquette, Edmund T., 4,701,066, Cl. 403-298.000.

Wronski, Christopher R., to Exxon Research and Engineering Company. Amorphous photoreceptor with high sensitivity to long wavelengths. 4,701,395, Cl. 430-58.000.

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Wu, Dan T.: *See—*
Korte, Kevin R.; Litzinger, Elmer; and Wu, Dan T., 4,700,722, Cl. 131-309.000.

Wu, Tai-Wing, to Eastman Kodak Company. Bilirubin-specific enzyme preparation, assay compositions, analytical elements and methods using same. 4,701,411, Cl. 435-25.000.

Wu, Tsung-Ching: *See—*
Perlegos, Gust; and Wu, Tsung-Ching, 4,701,776, Cl. 357-23.500.

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Wyllie, Michael G., to John Wyeth and Brother Limited. Method for prevention of hypertension. 4,701,462, Cl. 514-323.000.

Wyman, John E., to Hitachi Metals, LTD. Super paramagnetic fluids and methods of making super paramagnetic fluids. 4,701,276, Cl. 252-62.520.

Wysk, Hans-Joachim; Stellmach, Dieter; Nolte, Bernhard; Gronwald, Gerd; and Maedge, Werner, to Mannesmann Aktiengesellschaft. Printing apparatus with document cutting device. 4,701,063, Cl. 400-621.000.

Xanar, Inc.: *See—*
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Xerox Corporation: *See—*
Anderson, Robert W.; and Poleshuk, Michael, 4,701,772, Cl. 346-160.000.
Harrigan, Michael E.; Durbin, John A.; and Schroll, Ross E., 4,701,027, Cl. 350-334.000.
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Xianzhi, Chen: *See—*
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Yabuuchi, Toshihiko: *See—*
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Yagami, Hiroyuki: *See—*
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Yamada, Kazuo: *See—*
Kiuchi, Masao; Ito, Yoshiaki; Ishibashi, Nobuyuki; and Yamada, Kazuo, 4,701,368, Cl. 428-233.000.

Yamada, Mitsuhiko, to Dainippon Screen Manufacturing Co., Ltd. Method and apparatus for color separation in an image reproduction scanner. 4,701,790, Cl. 358-75.000.

Yamada, Shigeki: *See—*
Endo, Kazuyuki; Taniguchi, Motoaki; Takahashi, Masanobu; Yamada, Shigeki; and Kato, Kenshiro, 4,700,764, Cl. 152-526.000.

Yamada, Yasuhumi: *See—*
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Yamada, Yoshitaka: *See—*
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Takiguchi, Hideki; Yamada, Yoshitaka; Ohtani, Hirofumi; and Kashiwagi, Hiroshi, 4,701,405, Cl. 430-567.000.

Yamagata, Hiroshi, to Yamaha Hatsudoki Kabushiki Kaisha. Method for making a composite engine cylinder block with preformed liner. 4,700,444, Cl. 29-156.4WL.

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Tanabe, Yoshimitsu; Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,701,567, Cl. 568-719.000.

Yamaguchi, Katsumasa: *See—*
Masaki, Takeshi; Kawata, Koichi; Sakagaito, Yukuo; Yamaguchi, Katsumasa; Kinoshiro, Hiromichi; and Toba, Hiroto, 4,701,591, Cl. 219-121.0LT.

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Kurachi, Hisao; Minaminaka, Kazuyoshi; Ito, Takeo; and Yamakawa, Kiyoshi, 4,701,579, Cl. 200-5.00A.

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Yamamoto, Yoshinori: *See—*
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Yamamoto, Yosiharu: *See—*
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Yamanaka, Junichi, to Kabushiki Kaisha Toshiba. Pedestal control circuit. 4,701,786, Cl. 358-32.000.

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Inagoya, Osamu; Fujiwara, Hideo; Tottori, Takeshi; Yamano, Minoru; Kumasaka, Noriyuki; Otomo, Shigekazu; Kudo, Mitsuhiro; Morikawa, Juiti; Ishihara, Kiyoshi; Usui, Akira; and Hayashi, Masashi, 4,701,819, Cl. 360-122.000.

Yamashita, Haruyuki: *See—*
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Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,701,872, Cl. 364-718.000.
Yamauchi, Kouji; and Ueda, Chikai, to Mitsubishi Mining & Cement Co., Ltd. Apparatus for piling Portland cement packages in alignment on platform. 4,701,091, Cl. 414-70.000.
Yamauchi, Toshio: *See*—
Hattori, Hiroyuki; Uemura, Takashi; and Yamauchi, Toshio, 4,701,305, Cl. 422-73.000.
Yan, Tsoung Y., to Mobil Oil Corporation. Recovery of mercury and heat energy from waste using fluidized beds. 4,701,212, Cl. 75-26.000.
Yanagihara, Kenji: *See*—
Kuwahara, Hideyuki; Kondo, Bunji; Takada, Jun; Yanagihara, Kenji; Kimura, Mituo; and Niinomi, Masahiro, 4,701,301, Cl. 419-21.000.
Yanase, Sumio: *See*—
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Yashima, Michio; and Takahashi, Shuji, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle with an enclosed battery mounted to have a predetermined angular relation with respect to the body frame. 4,700,795, Cl. 180-68.500.
Yasuda, Makoto: *See*—
Ura, Syouzabu; Kikuchi, Tsutomu; and Yasuda, Makoto, 4,700,666, Cl. 123-52.0MB.
Yasue, Hideki; and Fukumura, Kagenori, to Toyota Jidosha Kabushiki Kaisha. Hydraulic shift controller for an automatic transmission having a first and second section. 4,700,591, Cl. 74-868.000.
Yazaki Corporation: *See*—
Yamanashi, Hidenori; Inada, Toshio; and Wakabayashi, Seiichi, 4,701,662, Cl. 313-51.000.
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Yelnosky, John; and Mir, Ghulam N., to Rorer Pharmaceutical Corporation. Amidinoureas for treating irritable bowel syndrome. 4,701,457, Cl. 514-256.000.
Yen, Huan-Wun: *See*—
Tangonan, Gregory L.; and Yen, Huan-Wun, 4,701,009, Cl. 350-96.120.
Yeo, Richard G.: *See*—
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Yeomans, James T., to Ofrex Group Holdings PLC. Document shredding machines. 4,700,902, Cl. 241-100.000.
Yeowell, David A.: *See*—
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Yogo, Kenji: *See*—
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Yohn, Brent D., to AMP Incorporated. Retention clip for electrical contacts. 4,701,004, Cl. 439-871.000.
Yoichi, Mikami: *See*—
Susumu, Kubo; Tsutomu, Ikeda; Yoichi, Takanami; and Yoichi, Mikami, 4,701,522, Cl. 530-370.000.
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Yokogawa, Fumihiko: *See*—
Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, 4,701,902, Cl. 369-77.100.
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Yonezawa, Kazuyoshi: *See*—
Okutsu, Hideo; Mikami, Koushirou; Yonezawa, Kazuyoshi; and Ichikawa, Kuniharu, 4,701,595, Cl. 219-364.000.
Yongli, Zhang: *See*—
Yuan, Ren; Xianzhi, Chen; Yuanxi, Feng; Guojiu, Li; Dake, Huang; Yongli, Zhang; and Quanzhong, Sun, 4,701,689, Cl. 322-19.000.
Yoo, Bok-Ryul: *See*—
Jung, Il N.; Cho, Ko D.; Lim, John C.; and Yoo, Bok-Ryul, 4,701,430, Cl. 502-62.000.
Yoshida, Daisuke: *See*—
Mizusaki, Shigenobu; Yoshida, Daisuke; and Saito, Yutaka, 4,701,570, Cl. 568-821.000.
Yoshida, Hiroshi: *See*—
Kitamura, Masatsugu; Wagatsuma, Kikuji; Watanabe, Tokumi; Yamashita, Naoki; and Yoshida, Hiroshi, 4,701,872, Cl. 364-718.000.
Yoshie, Yasunori: *See*—
Ikeda, Hidekatsu; Morikawa, Hiroyuki; and Yoshie, Yasunori, 4,700,441, Cl. 29-33.00P.
Yoshikawa, Seiichi; Yoshioka, Toshio; and Shimamura, Masaharu, to Toray Industries, Inc. Tobacco filter and fibrous ion exchange resin. 4,700,723, Cl. 131-334.000.
Yoshikawa, Yukihiro: *See*—
Tanabe, Yoshimitsu; Yamaguchi, Keizaburo; Yoshikawa, Yukihiro; Sugimoto, Kenichi; and Yamaguchi, Akihiro, 4,701,567, Cl. 568-719.000.
Yoshimoto, Satoshi, to Brother Kogyo Kabushiki Kaisha. Controller for energization of a stepper motor. 4,701,687, Cl. 318-696.000.
Yoshimura, Isao; Hata, Hideo; and Kaneko, Takashi, to Asahi-Dow Ltd. Composition for drawn film, cold drawn film made of said composition and process for manufacture of said film. 4,701,496, Cl. 525-240.000.
Yoshimura, Kazuyuki; and Sakakibara, Yoshio, to Fuji Photo Film Co., Ltd. Instant film unit with coloring means. 4,701,388, Cl. 430-209.000.
Yoshimura, Masahiro, to Sharp Kabushiki Kaisha. Image display panel drive. 4,701,799, Cl. 358-241.000.
Yoshioka, Minoru: *See*—
Aoyagi, Yoshiro; Kimura, Toshiyuki; Niinuma, Susumu; Yoshioka, Minoru; Yokogawa, Fumihiko; Matsumoto, Keiichi; Haeno, Akira; Sato, Takashi; Nishi, Yoshiro; Watanabe, Yoshihiko; Hirano, Hiroyuki; and Ogawa, Youichi, 4,701,902, Cl. 369-77.100.
Yoshioka, Toshio: *See*—
Yoshikawa, Seiichi; Yoshioka, Toshio; and Shimamura, Masaharu, 4,700,723, Cl. 131-334.000.
Young, Colin G. Computerized, central hydraulic, electronic variable suspension. 4,700,972, Cl. 280-707.000.
Young, Donald C.; and Green, James A., II, to Union Oil Company of California. Methods for removing biuret from urea by adsorption. 4,701,555, Cl. 564-38.000.
Young Engineering Inc.: *See*—
Hankinson, Julian E., Jr., 4,700,642, Cl. 112-121.140.
Young, William A. Three-tired vehicle carrier. 4,700,873, Cl. 224-42.070.
Yuan, Ren; Xianzhi, Chen; Yuanxi, Feng; Guojiu, Li; Dake, Huang; Yongli, Zhang; and Quanzhong, Sun, to Huazhong Institute of Technology. Optimal control power system stabilizer and method using simulating state variables. 4,701,689, Cl. 322-19.000.
Yuanxi, Feng: *See*—
Yuan, Ren; Xianzhi, Chen; Yuanxi, Feng; Guojiu, Li; Dake, Huang; Yongli, Zhang; and Quanzhong, Sun, 4,701,689, Cl. 322-19.000.
Yuge, Yooji: *See*—
Kawakatsu, Akira; Yuge, Yooji; Hayama, Noriyuki; Saito, Tokuyoshi; and Maeda, Umio, 4,701,663, Cl. 313-112.000.
Yuhasz, Kathleen M.: *See*—
Ferlauto, Robert J., Jr.; and Yuhasz, Kathleen M., 4,701,318, Cl. 424-52.000.
Zado, Frank M., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Water soluble condensation soldering flux. 4,701,224, Cl. 148-23.000.
Zahnradfabrik Friedrichshafen, AG.: *See*—
Seidl, Gunther, 4,701,111, Cl. 417-300.000.
Zambrow, John L.: *See*—
Dockus, Kostas F.; and Zambrow, John L., 4,701,127, Cl. 432-242.000.
Zampini, Anthony, to Monsanto Company. Polymeric membranes with ammonium salts. 4,701,186, Cl. 55-158.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. L-aminodicarboxylic acid alkanes. 4,701,552, Cl. 562-498.000.
Zard, Lydia: *See*—
Purcell, Thomas; and Zard, Lydia, 4,701,466, Cl. 514-450.000.
Zboril, Vaclav G.: *See*—
Mitchell, David J.; and Zboril, Vaclav G., 4,701,504, Cl. 526-83.000.
Zega, Henry E.: *See*—
Barrett, John P.; Schulz, Daniel R.; Kent, David E.; deFasselle, Robert J.; and Zega, Henry E., 4,700,884, Cl. 236-12.120.
Zehner, Georgia L.; Boland, Leona G.; and Stevens, Robert A., to Kimberly-Clark Corporation. Form-fitting self-adjusting disposable garment with absorbent retaining flaps. 4,701,173, Cl. 604-385.00A.
Zehner, Georgia L.: *See*—
Boland, Leona G.; Zehner, Georgia L.; and Stevens, Robert A., 4,701,171, Cl. 604-385.00A.
Zelko, William E.: *See*—
Good, Robert S.; Scully, Michael J.; and Zelko, William E., 4,701,139, Cl. 439-497.000.
Zeiler+Gmelin GmbH & Co.: *See*—
Seng, Hans-Peter, 4,701,220, Cl. 106-203.000.
Zemanek, Charles P.: *See*—
Narula, Dipak; Be, Anh; and Zemanek, Charles P., 4,701,380, Cl. 428-447.000.
Zenith Electronics Corporation: *See*—
Blacker, Allen P.; and Chiodi, Wayne R., 4,701,678, Cl. 315-382.000.
Borg, Arthur N., 4,701,753, Cl. 340-731.000.
Palac, Kazimir, 4,701,666, Cl. 313-407.000.
Ziegler, Kurt: *See*—
Artzt, Peter; Muller, Heinz; Ziegler, Kurt; Egbers, Gerhard; and Wokaun, Jacek, 4,700,431, Cl. 19-105.000.
Zieke, Larry M.: *See*—
Behr, Raymond D.; and Zieke, Larry M., 4,701,358, Cl. 428-35.000.

Ziemba, Richard T.: *See*—
Pettinga, Robert; Dix, Joseph; McHugh, Thomas O.; Sibley, Lincoln L., Jr.; Ziemba, Richard T.; and Forrester, Victor J., 4,700,608, Cl. 89-11.000.
Zimmer, Herbert, to Dornier GmbH. Transverse driving bodies, particularly airplane wings. 4,700,911, Cl. 244-35.00R.
Zoellner, Roger O.: *See*—
Searcy, James A.; Zoellner, Roger O.; and Hoffmann, Ronald C., 4,700,688, Cl. 126-299.00D.
Zoran Corporation: *See*—
Sirkin, Eric R., 4,700,465, Cl. 437-20.000.
Zuliani, Alessandro, to Cosatto SpA. Lavatory brush. 4,700,423, Cl. 15-160.000.
Zupet, Pavle: *See*—
Kobe, Joze; Gnidovec, Joze; and Zupet, Pavle, 4,701,526, Cl. 544-251.000.
Zweili, Markus: *See*—
Hanni, Eduard; and Zweili, Markus, 4,700,599, Cl. 83-94.000.
501 TDK Corporation: *See*—
Fujii, Tatsuo, 4,700,839, Cl. 206-444.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF OCTOBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ase (UK) Limited: *See*—
Temple, John D., Re. 32,524, Cl. 280-808.000.

Fishbaugh, Byron L., to Goodyear Tire & Rubber Company, The. Hay rake. Re. 32,522, Cl. 56-400.000.

Goodyear Tire & Rubber Company, The: *See*—
Fishbaugh, Byron L., Re. 32,522, Cl. 56-400.000.

Hitachi, Ltd.: *See*—
Shinkawa, Keiro; Noda, Masaki; and Sodeyama, Chuichi, Re. 32,527, Cl. 331-99.000.

Hochstein, Peter A. Gated solid state FET relay. Re. 32,526, Cl. 307-571.000.

Noda, Masaki: *See*—
Shinkawa, Keiro; Noda, Masaki; and Sodeyama, Chuichi, Re. 32,527, Cl. 331-99.000.

Pannu, Jaswant S. Universal intraocular lens and a method of measuring an eye chamber size. Re. 32,525, Cl. 623-6.000.

Resnick, Marlene; and Sturtevant, Roger C. Solar heating. Re. 32,523, Cl. 126-422.000.

Shinkawa, Keiro; Noda, Masaki; and Sodeyama, Chuichi, to Hitachi, Ltd. FET microwave oscillator being frequency stabilized by capacitive reactance micro-strip stub line. Re. 32,527, Cl. 331-99.000.

Sodeyama, Chuichi: *See*—
Shinkawa, Keiro; Noda, Masaki; and Sodeyama, Chuichi, Re. 32,527, Cl. 331-99.000.

Sturtevant, Roger C.: *See*—
Resnick, Marlene; and Sturtevant, Roger C., Re. 32,523, Cl. 126-422.000.

Temple, John D., to Ase (UK) Limited. Adjustable seat belt anchorage. Re. 32,524, Cl. 280-808.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

AG-Bag Corporation: *See*—
Johnson, William C.; Rasmussen, David H.; and Lee, Richard H., B1 4,337,805, Cl. 141-71.000.

Eckerle, Joseph S. High efficiency electrical power conditioner. B1 4,042,890, 10-20-87, Cl. 330-207.00A.

Johnson, William C.; Rasmussen, David H.; and Lee, Richard H., to AG-Bag Corporation. Agricultural bag loading apparatus. B1 4,337,805, 10-20-87, Cl. 141-71.000.

Kubota Tekko Kabushiki Kaisha: *See*—
Murayama, Yoshinobu; Sada, Kenzou; and Kutomi, Mitsuhiro, B1 3,980,151, Cl. 180-261.000.

Kutomi, Mitsuhiro: *See*—
Murayama, Yoshinobu; Sada, Kenzou; and Kutomi, Mitsuhiro, B1 3,980,151, Cl. 180-261.000.

Lee, Richard H.: *See*—
Johnson, William C.; Rasmussen, David H.; and Lee, Richard H., B1 4,337,805, Cl. 141-71.000.

Murayama, Yoshinobu; Sada, Kenzou; and Kutomi, Mitsuhiro, to Kubota Tekko Kabushiki Kaisha. Front wheel drive assembly for four-wheel drive tractor. B1 3,980,151, 10-20-87, Cl. 180-261.000.

Rasmussen, David H.: *See*—
Johnson, William C.; Rasmussen, David H.; and Lee, Richard H., B1 4,337,805, Cl. 141-71.000.

Sada, Kenzou: *See*—
Murayama, Yoshinobu; Sada, Kenzou; and Kutomi, Mitsuhiro, B1 3,980,151, Cl. 180-261.000.

LIST OF DESIGN PATENTEES

Allison Corporation: *See*—
Seltzer, Samuel M.; and Dennison, Saul, 292,354, Cl. D6-440.000.

Americal Corporation: *See*—
Hubbard, Robert L., 292,345, Cl. D2-329.000.

American Standard Inc.: *See*—
Enthoven, Axel, 292,430, Cl. D23-241.000.

AMP Incorporated: *See*—
Waters, Mark H.; and Lambert, Lahman D., II, 292,395, Cl. D13-24.000.

Armstrong International Inc.: *See*—
Schlesch, Ronald D., 292,391, Cl. D12-317.000.

Austin, Arnold S., to Quabaug Rubber Company. Shoe sole. 292,344, 10-20-87, Cl. D2-320.000.

Baburek, Otakar, to Tyrolia Freizeitgeraete Gesellschaft m.b.h. & Co. OHG. Physical exerciser. 292,427, 10-20-87, Cl. D21-198.000.

Baptiste, Trevor I. Monacle. 292,411, 10-20-87, Cl. D16-107.000.

Bartlett, Robert L.: *See*—
Legler, John G.; Bartlett, Robert L.; and Folkerth, Harold E., 292,407, Cl. D15-133.000.

Bartlett, William L.; Cruz, Edward; and Harding, David, to Rival Manufacturing Company. Food processor. 292,364, 10-20-87, Cl. D7-384.000.

Boggs, Cathy Y.; and Boggs, Larry W. Headset telephone. 292,400, 10-20-87, Cl. D14-53.000.

Boggs, Larry W.: *See*—
Boggs, Cathy Y.; and Boggs, Larry W., 292,400, Cl. D14-53.000.

Boucher, Guy, to Telemecanique Electrique. Programable controller. 292,394, 10-20-87, Cl. D13-12.000.

Bouilhet, Henry, to La Societe Orfevrerie Christofle. Handle for a spoon or similar article of flatware. 292,360, 10-20-87, Cl. D7-152.000.

Bouilhet, Henry, to La Societe Orfevrerie Christofle. Handle for a fork or similar article of flatware. 292,361, 10-20-87, Cl. D7-152.000.

Boyle, William F.; and Chandler, Maurice P., to General Motors Corporation. Wheel cover. 292,389, 10-20-87, Cl. D12-211.000.

Bozarth, J. Dave. Closure penetrating support for a bottle. 292,365, 10-20-87, Cl. D7-387.000.

Bramwell, David W., to EGA Limited. Adaptor for a wire channel. 292,396, 10-20-87, Cl. D13-24.000.

Brandt, Charles M.; and Everette, Claude J., to Sewell Plastics Inc. Bottle. 292,378, 10-20-87, Cl. D9-396.000.

Brightbill, Keith E.: *See*—
Kruse, Wayne L.; Crabtree, Joe; and Brightbill, Keith E., 292,406, Cl. D15-23.000.

Brossard, Ansgar; and Korner, Arno, to Viasit Burositzmobel GmbH. Chair. 292,351, 10-20-87, Cl. D6-366.000.

Brown, Benny L.: *See*—
Brown, Sandra C.; and Brown, Benny L., 292,386, Cl. D12-130.000.

Brown, Sandra C.; and Brown, Benny L. Infant walker. 292,386, 10-20-87, Cl. D12-130.000.

Campagne Moet & Chandon: *See*—
Pozzo di Borgo, Philippe, 292,377, Cl. D9-370.000.

Cardinal Industries, Inc.: *See*—
Downing, Lucien R., 292,434, Cl. D25-22.000.

Carnahan, Virgil B. Card punch. 292,419, 10-20-87, Cl. D19-72.000.
Carter, James S.: *See—*
Wilson, Thomas C.; and Carter, James S., 292,404, Cl. D14-107.000.
CDA Industries Inc.: *See—*
Headon, Randall G., 292,355, Cl. D6-479.000.
Chandler, Maurice P.: *See—*
Boyle, William F.; and Chandler, Maurice P., 292,389, Cl. D12-211.000.
Chien, Ruca. Convertible card table or similar article. 292,353, 10-20-87, Cl. D6-430.000.
Chrysler Motors Corporation: *See—*
Kifer, Harlan E.; Litner, Richard C.; Megregian, Richard; and Moore, Michael G., 292,398, Cl. D14-10.000.
Clark, James B., to MicroComputer Accessories, Inc. Combined printer stand and paper refolding apparatus. 292,416, 10-20-87, Cl. D18-23.000.
Cockrell, William M. Measuring dispenser for coffee and other granular substances. 292,358, 10-20-87, Cl. D7-50.000.
Coffel, Michael. Game board. 292,422, 10-20-87, Cl. D21-33.000.
Coin Acceptors, Inc.: *See—*
DelPercio, Michael J.; and Holland, Charlie R., 292,420, Cl. D20-4.000.
Cooper, William C. Bottle. 292,371, 10-20-87, Cl. D9-309.000.
Costa, Allan. Dual unit container. 292,373, 10-20-87, Cl. D9-347.000.
Crabtree, Joe: *See—*
Kruse, Wayne L.; Crabtree, Joe; and Brightbill, Keith E., 292,406, Cl. D15-23.000.
Cruz, Edward: *See—*
Bartlett, William L.; Cruz, Edward; and Harding, David, 292,364, Cl. D7-384.000.
Custom Shade & Awning Corp.: *See—*
Fairbanks, Lyman N., 292,370, Cl. D8-369.000.
Dansk Pressalit A/S: *See—*
Rasmussen, Else J., 292,432, Cl. D23-311.000.
Daw, Albert E. Knife rack. 292,359, 10-20-87, Cl. D7-74.000.
DelPercio, Michael J.; and Holland, Charlie R., to Coin Acceptors, Inc. Vending machine. 292,420, 10-20-87, Cl. D20-4.000.
Dennison, Saul: *See—*
Seltzer, Samuel M.; and Dennison, Saul, 292,354, Cl. D6-440.000.
Dowdey, Christopher C.: *See—*
Zepp, Lawrence P.; Dowdey, Christopher C.; Riggs, Robert B.; and Trostle, D. Mark, 292,392, Cl. D12-317.000.
Downing, Lucien R., to Cardinal Industries, Inc. Single family house. 292,434, 10-20-87, Cl. D25-22.000.
Dresser Industries, Inc.: *See—*
Wilson, Thomas C.; and Carter, James S., 292,404, Cl. D14-107.000.
Eastman Kodak Company: *See—*
Harrison, Larry D., 292,408, Cl. D16-30.000.
Harrison, Larry D., 292,409, Cl. D16-30.000.
EGA Limited: *See—*
Bramwell, David W., 292,396, Cl. D13-24.000.
English, Loren: *See—*
Williams, David E.; Parham, Michael; and English, Loren, 292,423, Cl. D21-38.000.
Entertainment Technology: *See—*
Williams, David E.; Parham, Michael; and English, Loren, 292,423, Cl. D21-38.000.
Enthoven, Axel, to American Standard Inc. Faucet. 292,430, 10-20-87, Cl. D23-241.000.
Ernst Leitz Wetzlar G.m.b.H: *See—*
Janke, Heinrich; Hengst, Alfred; and Uellenberg, Hans-Kurt, 292,412, Cl. D16-133.000.
Everette, Claude J.: *See—*
Brandt, Charles M.; and Everette, Claude J., 292,378, Cl. D9-396.000.
Fairbanks, Lyman N., to Custom Shade & Awning Corp. Bracket for shaping curtains and similar articles. 292,370, 10-20-87, Cl. D8-369.000.
Folkerth, Harold E.: *See—*
Legler, John G.; Bartlett, Robert L.; and Folkerth, Harold E., 292,407, Cl. D15-133.000.
General Motors Corporation: *See—*
Boyle, William F.; and Chandler, Maurice P., 292,389, Cl. D12-211.000.
Ruzzin, Richard F., 292,390, Cl. D12-211.000.
Goldman, Paul R., to Goldman, Paul R. Chaise lounge. 292,350, 10-20-87, Cl. D6-361.000.
Greco, Vincent. Latching device for rolling gates. 292,369, 10-20-87, Cl. D8-331.000.
Griffin, Daniel V., to Whale Scientific, Inc. Combined unitary disposble cytology chamber and filter card for analysis of body fluids. 292,433, 10-20-87, Cl. D24-22.000.
Gritz, Robert W.: *See—*
Poliak, John M.; Gritz, Robert W.; and Lopez, Juan M., 292,397, Cl. D13-28.000.
Hampshire, James F.; and Tomblin, Glen E., to Rubbermaid Commercial Products Inc. Adjustable work surface. 292,352, 10-20-87, Cl. D6-418.000.
Harding, David: *See—*
Bartlett, William L.; Cruz, Edward; and Harding, David, 292,364, Cl. D7-384.000.
Harrison, Larry D., to Eastman Kodak Company. Copier. 292,408, 10-20-87, Cl. D16-30.000.
Harrison, Larry D., to Eastman Kodak Company. Copier. 292,409, 10-20-87, Cl. D16-30.000.
Headon, Randall G., to CDA Industries Inc. Display stand. 292,355, 10-20-87, Cl. D6-479.000.
Hengst, Alfred: *See—*
Janke, Heinrich; Hengst, Alfred; and Uellenberg, Hans-Kurt, 292,412, Cl. D16-133.000.
Holland, Charlie R.: *See—*
DelPercio, Michael J.; and Holland, Charlie R., 292,420, Cl. D20-4.000.
Hoyt, Earl, to Quantum Logic Corporation. Pyrometer. 292,382, 10-20-87, Cl. D10-57.000.
Hubbard, Robert L., to Americal Corporation. Sock. 292,345, 10-20-87, Cl. D2-329.000.
Hunter, Murray D. K. Eye shield. 292,410, 10-20-87, Cl. D16-102.000.
Illinois Tool Works Inc.: *See—*
Udelhofen, Mark J., 292,385, Cl. D11-210.000.
International Hydraulic Systems, Inc.: *See—*
Zepp, Lawrence P.; Dowdey, Christopher C.; Riggs, Robert B.; and Trostle, D. Mark, 292,392, Cl. D12-317.000.
J & L Importers, Inc.: *See—*
Oh, Chang H., 292,362, Cl. D7-360.000.
Oh, Chang H., 292,363, Cl. D7-360.000.
Jacobs, Andre'; May, Richard; and Vanderbroek, Marcel, to Procter & Gamble Company, The. Bottle. 292,374, 10-20-87, Cl. D9-349.000.
Jacobs, Andre ; May, Richard; Vandebroek, Marcel; and Sporen, Frieda, to Procter & Gamble Company, The. Bottle. 292,375, 10-20-87, Cl. D9-349.000.
Jacobs, Andre ; May, Richard; Vandebroek, Marcel; and Sporen, Frieda, to Procter & Gamble Company, The. Bottle. 292,376, 10-20-87, Cl. D9-370.000.
Janke, Heinrich; Hengst, Alfred; and Uellenberg, Hans-Kurt, to Ernst Leitz Wetzlar G.m.b.H. Binocular. 292,412, 10-20-87, Cl. D16-133.000.
Jim O'Neal Distributing, Inc.: *See—*
O'Neal, James M., 292,417, Cl. D18-30.000.
Johnson, Logan W.: *See—*
Lee, David W.; and Johnson, Logan W., 292,401, Cl. D14-68.000.
Jones, A. Shepherd, III. Jacket. 292,341, 10-20-87, Cl. D2-187.000.
Jones, Brya. Rattle. 292,424, 10-20-87, Cl. D21-65.000.
Kelley, Brenda C.: *See—*
MacGregor, Bruce; and Kelley, Brenda C., 292,343, Cl. D2-314.000.
Kifer, Harlan E.; Litner, Richard C.; Megregian, Richard; and Moore, Michael G., to Chrysler Motors Corporation. Front control panel for a combined vehicular cassette player and radio receiver. 292,398, 10-20-87, Cl. D14-10.000.
Kitani, Natsu; Mishiro, Benito; and Sugiyama, Yoshihiko, to Matsushita Electric Industrial Co., Ltd. Combined printer and memory capacity expander for a computer. 292,405, 10-20-87, Cl. D14-111.000.
Kohler Co.: *See—*
Kohler, Herbert V., Jr., 292,431, Cl. D23-301.000.
Kohler, Herbert V., Jr., to Kohler Co. Water closet. 292,431, 10-20-87, Cl. D23-301.000.
Kolomeyer, Norton. Walking stick or similar article. 292,346, 10-20-87, Cl. D3-7.000.
Korner, Arno: *See—*
Brossard, Ansgar; and Korner, Arno, 292,351, Cl. D6-366.000.
Kowollik, Mathias M.; Sneller, Jack A.; and Speidel, George S., III, to Procter & Gamble Company, The. Combined closure and measuring cup. 292,381, 10-20-87, Cl. D9-453.000.
Kruse, Wayne L.; Crabtree, Joe; and Brightbill, Keith E., to Murray Ohio Manufacturing Company, The. Lawn tractor. 292,406, 10-20-87, Cl. D15-23.000.
Kuether, Barbara; and Kuether, Mark. Splatter cover for microwave oven. 292,366, 10-20-87, Cl. D7-391.000.
Kuether, Mark: *See—*
Kuether, Barbara; and Kuether, Mark, 292,366, Cl. D7-391.000.
La Societe Orfevrerie Christofle: *See—*
Bouilhet, Henry, 292,360, Cl. D7-152.000.
Bouilhet, Henry, 292,361, Cl. D7-152.000.
Lambert, Lahman D., II: *See—*
Waters, Mark H.; and Lambert, Lahman D., II, 292,395, Cl. D13-24.000.
Lee, David W.; and Johnson, Logan W., to Rosemount Inc. Hand held digital communicator housing. 292,401, 10-20-87, Cl. D14-68.000.
Legler, John G.; Bartlett, Robert L.; and Folkerth, Harold E., to Shopsmith, Inc. Combined guard and dust collector for a table saw. 292,407, 10-20-87, Cl. D15-133.000.
Leviton Manufacturing Company, Inc.: *See—*
Poliak, John M.; Gritz, Robert W.; and Lopez, Juan M., 292,397, Cl. D13-28.000.
Litner, Richard C.: *See—*
Kifer, Harlan E.; Litner, Richard C.; Megregian, Richard; and Moore, Michael G., 292,398, Cl. D14-10.000.
Lopez, Juan M.: *See—*
Poliak, John M.; Gritz, Robert W.; and Lopez, Juan M., 292,397, Cl. D13-28.000.
Lyke, Hattie. Face mask for trying on clothing without smearing make-up. 292,438, 10-20-87, Cl. D29-17.000.
MacGregor, Bruce; and Kelley, Brenda C., to Pensa, Inc. Shoe upper. 292,343, 10-20-87, Cl. D2-314.000.
Marpac Industries, Inc.: *See—*
Sykes, Donald J., 292,372, Cl. D9-339.000.
Matra Communication: *See—*
Renard, Marc, 292,403, Cl. D14-101.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kitani, Natsu; Mishiro, Benito; and Sugiyama, Yoshihiko, 292,405, Cl. D14-111.000.
May, Richard: *See*—
Jacobs, Andre'; May, Richard; and Vanderbroek, Marcel, 292,374, Cl. D9-349.000.
Jacobs, Andre ; May, Richard; Vandebroek, Marcel; and Sporen, Frieda, 292,375, Cl. D9-349.000.
Jacobs, Andre ; May, Richard; Vandebroek, Marcel; and Sporen, Frieda, 292,376, Cl. D9-370.000.
Mazda Motor Corporation: *See*—
Oda, Yasuji, 292,387, Cl. D12-169.000.
McLean, Harold D. Novelty figurine. 292,384, 10-20-87, Cl. D11-160.000.
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Winner, Delores M. Stuffed toy bear. 292,426, 10-20-87, Cl. D21-159.000.
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ISSUED OCTOBER 20, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

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103 4,700,772
134.1 4,700,773
140 4,700,774

CLASS 166

98 4,700,775
157 4,700,776
185 4,700,777
250 4,700,778
263 4,700,779
293 4,700,780
303 4,700,781
330 4,700,782
372 4,700,783

CLASS 172

126 4,700,784
705 4,700,785
799.5 4,700,786

CLASS 173

164 4,700,787

CLASS 174

45 R 4,701,577
52 TC 4,701,573
93 4,701,574
107 4,701,575
117 F 4,701,576

CLASS 175

61 4,700,788
202 4,700,789
410 4,700,790

CLASS 177

2 4,700,791
178 4,700,792
181 4,700,793
245 4,700,656

CLASS 180

6.44 4,700,794
68.5 4,700,795
88 4,700,796
197 4,700,797
209 4,700,798
219 4,700,799
249 4,700,800
261 B1 3,980,151
287 4,700,801
324 4,700,802

CLASS 181

106 4,700,803
121 4,700,804
265 4,700,805
282 4,700,806

CLASS 182

92 4,700,807

CLASS 184

6.18 4,700,808

CLASS 187

1 R 4,700,809
101 4,700,810
116 4,700,811

CLASS 188

1.11 4,700,812
18 A 4,700,813
67 4,700,814
286 4,700,815
323 4,700,816
380 4,700,817

CLASS 190

27 4,700,818

CLASS 192

3.62 4,700,819
48.5 4,700,820
106.2 4,700,821
4,700,822
107 M 4,700,823

CLASS 198

346.2 4,700,824
419 4,700,825
550.12 4,700,826
771 4,700,827

CLASS 200

5 A 4,701,579
5 B 4,701,578
5 E 4,701,580
52 R 4,701,581
61.42 4,701,582
148 B 4,701,583

CLASS 201

3 4,701,243

CLASS 204

44.4 4,701,244
78 4,701,245
130 4,701,246
131 4,701,247
201 4,701,248
279 4,701,249
283 4,701,250
298 4,701,251
402 4,701,252
416 4,701,253

CLASS 206

214 4,700,829
223 4,700,828
229 4,700,830
232 4,700,831
320 4,700,832
380 4,700,833
388 4,700,834
411 4,700,835
427 4,700,836
4,700,837
438 4,700,838
444 4,700,839
449 4,700,840
499 4,700,841
508 4,700,842
521 4,700,843
586 4,700,844

CLASS 208

26 4,701,254
139 4,701,255

CLASS 209

139.1 4,701,256
166 4,701,257

CLASS 210

232 4,701,258
450 4,701,259
521 4,701,260
606 4,701,261
699 4,701,262
728 4,701,263
734 4,701,264
744 4,701,265
803 4,701,266
806 4,701,267

CLASS 211

18 4,700,845
41 4,700,846
62 4,700,847
63 4,700,848
71 4,700,849
131 4,700,850

CLASS 212

181 4,700,851
189 4,700,852

CLASS 213

50 4,700,853
62 R 4,700,854
75 TC 4,700,855

CLASS 215

11 E 4,700,856
232 4,700,857
237 4,700,858
252 4,700,859
256 4,700,860
309 4,700,861

CLASS 219

10.55 E 4,701,585
10.55 R 4,701,586
10.57 4,701,584
10.75 4,701,587
10.77 4,701,588
50 4,701,589
121 LT 4,701,591
4,701,592
121 PR 4,701,590
216 4,701,593
219 4,701,594
364 4,701,595
483 4,701,596
521 4,701,597
535 4,701,598
544 4,701,599

CLASS 220

6 4,700,862
67 4,700,863
86 R 4,700,864
274 4,700,865
316 4,700,866
410 4,700,867
465 4,700,868

CLASS 221

229 4,700,869

CLASS 222

63 4,700,870
107 4,700,871
162 4,700,872

CLASS 224

42.07 4,700,873
178 4,700,874

CLASS 226

189 4,700,875

CLASS 227

131 4,700,876

CLASS 228

2 4,700,877
37 4,700,878
123 4,700,879
180.1 4,700,880
194 4,700,881
4,700,882

CLASS 229

125.17 4,700,883

CLASS 235

375 4,701,600
449 4,701,601

CLASS 236

12.12 4,700,884
12.16 4,700,885
25 R 4,700,886
49 4,700,887

CLASS 237

2 A 4,700,888
12.3 C 4,700,889

CLASS 239

103 4,700,890
132.5 4,700,891
289 4,700,892
498 4,700,893
555 4,700,894
664 4,700,895
693 4,700,896
741 4,700,897

CLASS 241

14 4,700,898
30 4,700,899
37 4,700,900
37.5 4,700,901
100 4,700,902
101.2 4,700,903

CLASS 242

18 R 4,700,904
67.1 R 4,700,905
67.3 R 4,700,906
75.5 4,700,907
86.4 4,700,908
182 4,700,909

CLASS 244

1 R 4,700,910
35 R 4,700,911
63 4,700,912

CLASS 248

73 4,700,913
155.1 4,700,914
188.1 4,700,915
225.2 4,700,916
228 4,700,917
251 4,700,918
288.5 4,700,919
370 4,700,920
421 4,700,921
558 4,700,922
679 4,700,923

CLASS 250

201 4,701,602
4,701,603
4,701,604
4,701,605
4,701,606
205 4,701,607
4,701,608
4,701,609
223 B 4,701,612
227 4,701,610
4,701,611
4,701,613
4,701,614
237 G 4,701,615
251 4,701,616
327.2 4,701,617
330 4,701,618
338 4,701,619
398 4,701,620
435 4,701,621
486.1 4,701,622
492.2 4,701,623
554 4,701,624
573 4,701,625
578 4,701,626

CLASS 251

58 4,700,924
73 4,700,925
149.8 4,700,926
158 4,700,927
310 4,700,928

CLASS 252

8.551 4,701,270
8.554 4,701,271
8.57 4,701,269
8.8 4,701,268
28 4,701,272
32.5 4,701,273
46.3 4,701,274
62.52 4,701,275
4,701,276
75 4,701,277
132 4,701,278
511 4,701,279
633 4,701,280

CLASS 260

367 4,701,281
410.9 R 4,701,282
507 R 4,701,283
513 N 4,701,284
545 P 4,701,285

CLASS 261

36.1 4,701,286
81 4,701,287

CLASS 264

1.4 4,701,288
8 4,701,289
40.1 4,701,290
248 4,701,291
255 4,701,292
258 4,701,293
518 4,701,294
519 4,701,295

CLASS 266

246 4,700,929
267 4,700,930

CLASS 267

35 4,700,931
136 4,700,932
140.1 4,700,933
4,700,934

CLASS 269

126 4,700,935
226 4,700,936
304 4,700,937
322 4,700,938

CLASS 270

39 4,700,939
58 4,700,940

CLASS 271

151 4,700,941

CLASS 272

73 4,700,942
96 4,700,943
117 4,700,944
127 4,700,945
134 4,700,946
146 4,700,947

CLASS 273

1 GH 4,700,950
143 R 4,700,948
192 4,700,949
264 4,700,951
369 4,700,952

CLASS 277

38 4,700,953
165 4,700,954

CLASS 279

4 4,700,955
19.4 4,700,956
117 4,700,957

CLASS 280

11.1 BT 4,700,958
91 4,700,960
152 A 4,700,961
220 4,700,962
276 4,700,963
289 D 4,700,965
289 R 4,700,964
432 4,700,966
609 4,700,967
704 4,700,968
705 4,700,969
4,700,970
707 4,700,971
4,700,972
735 4,700,973
791 R 4,700,959
806 4,700,974
808 Re.32,524
824 4,700,975

CLASS 283

101 4,700,976

CLASS 293

126 4,700,977

CLASS 294

9 4,700,978
89 4,700,979

CLASS 296

1 F 4,700,981
1 S 4,700,980
21 4,701,627
107 4,700,982
146 4,700,983
4,700,984
181 4,700,985

CLASS 297

157 4,700,986
159 4,700,987
254 4,700,988
331 4,700,989

CLASS 303

9.69 4,700,990
113 4,700,991

CLASS 305

51 4,700,992

CLASS 307

9 4,701,628
10 R 4,701,629
112 4,701,630
254 4,701,631
261 4,701,632
269 4,701,633
4,701,634
270 4,701,635
297 4,701,636
4,701,637
300 4,701,638
350 4,701,639
400 4,701,640
445 4,701,641
446 4,701,642
450 4,701,643
530 4,701,644
570 4,701,645
4,701,646
571 Re.32,526

CLASS 310

29 4,701,647
61 4,701,648
68 R 4,701,649
4,701,650
90 4,701,651
112 4,701,652
152 4,701,653
153 4,701,654
237 4,701,655
254 4,701,656
313 C 4,701,657
334 4,701,658
4,701,659
338 4,701,660
360 4,701,661

CLASS 312

312 4,700,993
330 R 4,700,994

CLASS 313

51 4,701,662
112 4,701,663
4,701,664
402 4,701,665
407 4,701,666
594 4,701,667

CLASS 315

17 4,701,668
155 4,701,669
169.3 4,701,670
224 4,701,671
241 S 4,701,672
244 4,701,673
276 4,701,674
287 4,701,680
310 4,701,675
362 4,701,676
382 4,701,677
4,701,678
383 4,701,679

CLASS 318

16 4,701,681
52 4,701,682
254 4,701,683
282 4,701,684
309 4,701,685
632 4,701,686
696 4,701,687

CLASS 320

25 4,701,688

CLASS 322

19 4,701,689
28 4,701,690
32 4,701,691
90 4,701,692

CLASS 323

303 4,701,693
317 4,701,694

CLASS 324

73 R 4,701,696
96 4,701,697
116 4,701,698
133 4,701,699
158 F 4,701,700
4,701,703
158 P 4,701,702
158 R 4,701,701
207 4,701,704
306 4,701,705
309 4,701,706
4,701,707
311 4,701,708
312 4,701,709
318 4,701,710
322 4,701,711
340 4,701,712
442 4,701,713
510 4,701,695

CLASS 328

56 4,701,714
165 4,701,715

CLASS 330

43 4,701,716
149 4,701,717
207 A B1 4,042,890
253 4,701,718
258 4,701,719
260 4,701,720

CLASS 331

99 Re.32,527

CLASS 333

14 4,701,722
33 4,701,723
103 4,701,724
185 4,701,725
4,701,726
204 4,701,727
212 4,701,728
219 4,701,729
237 4,701,730
257 4,701,731

CLASS 334

56 4,701,732

CLASS 335

18 4,701,733
79 4,701,721
128 4,701,734
282 4,701,735
299 4,701,736
301 4,701,737

CLASS 336

92 4,701,738

CLASS 338

34 4,701,739
164 4,701,740

CLASS 340

57 4,701,741
58 4,701,742
84 4,701,743
347 DD 4,701,744
4,701,745
4,701,746
365 P 4,701,747

365 S 4,701,748
384 E 4,701,750
384 R 4,701,749
556 4,701,751
723 4,701,752
731 4,701,753
815.03 4,701,754
825.02 4,701,755
4,701,756
825.06 4,701,757
825.44 4,701,759
825.48 4,701,758
993 4,701,760

CLASS 342

1 4,701,761
417 4,701,762

CLASS 343

700 MS 4,701,763
742 4,701,764
897 4,701,765

CLASS 346

1.1 4,701,766
74.2 4,701,767
74.4 4,701,768
76 PH 4,701,769
4,701,836
135.1 4,701,770
4,701,837
140 R 4,701,771
160 4,701,772

CLASS 350

3.66 4,701,006
3.7 4,701,005
96.10 4,701,007
96.12 4,701,008
4,701,009
96.15 4,701,010
96.18 4,701,011
96.19 4,701,012
96.20 4,701,013
4,701,014
96.23 4,701,015
4,701,016
96.34 4,701,017
127 4,701,019
128 4,701,020
174 4,701,018
267 4,701,021
278 4,701,022
321 4,701,023
331 R 4,701,024
333 4,701,025
4,701,026
334 4,701,027
337 4,701,028
351 4,701,029
354 4,701,030
371 4,701,031
413 4,701,032
425 4,701,033
427 4,701,034
505 4,701,035
622 4,701,036
634 4,701,037

CLASS 351

162 4,701,038

CLASS 353

245 4,701,801

CLASS 354

80 4,701,039
109 4,701,040
413 4,701,041

CLASS 355

3 DD 4,701,042
4,701,043
7 4,701,044
20 4,701,045
39 4,701,046

CLASS 356

1 4,701,047
4,701,048
4,701,049
4,701,050
336 4,701,051
369 4,701,052
375 4,701,053

CLASS 357

13 4,701,773
17 4,701,774
23.12 4,701,775
23.5 4,701,776
42 4,701,777
45 4,701,778
48 4,701,779
51 4,701,780
70 4,701,781

CLASS 358

12 4,701,783
31 4,701,785
32 4,701,786
36 4,701,787
64 4,701,788
65 4,701,789
75 4,701,790
109 4,701,791
111 4,701,792
140 4,701,793
147 4,701,794
150 4,701,795
154 4,701,796
186 4,701,797
213.17 4,701,784
213.26 4,701,798
227 4,701,782
241 4,701,799
244 4,701,800
246 4,701,802
260 4,701,803
280 4,701,804
282 4,701,805
283 4,701,806
284 4,701,807
287 4,701,808
293 4,701,809
296 4,701,810
298 4,701,811

CLASS 360

32 4,701,812
71 4,701,813
72.3 4,701,814
77 4,701,815
96.4 4,701,816
96.5 4,701,817
106 4,701,818
4,701,823
122 4,701,819
125 4,701,820
130.24 4,701,821
132 4,701,822

CLASS 361

24 4,701,824
119 4,701,825
283 4,701,826
309 4,701,827
383 4,701,828
386 4,701,829
395 4,701,830

CLASS 362

147 4,701,831
192 4,701,835
281 4,701,832
299 4,701,833
307 4,701,834

CLASS 364

164 4,701,838
167 4,701,839
200 4,701,840
4,701,841
4,701,842
4,701,843
4,701,844
4,701,845
4,701,846
4,701,847
300 4,701,848
401 4,701,849
415 4,701,850
419 4,701,851
424.1 4,701,852
4,701,853
426 4,701,854
4,701,855
466 4,701,856
477 4,701,857
483 4,701,858
490 4,701,859
4,701,860
502 4,701,861
513.5 4,701,862
518 4,701,863
521 4,701,864
4,701,865
550 4,701,866
4,701,867
558 4,701,868
562 4,701,869
580 4,701,870
718 4,701,871
4,701,872
724 4,701,873
4,701,874
728 4,701,875
4,701,876
784 4,701,877
900 4,701,878

CLASS 365

49 4,701,879
106 4,701,880
122 4,701,881
154 4,701,882
4,701,883
189 4,701,884
4,701,885
4,701,886
200 4,701,887
203 4,701,888
230 4,701,889

CLASS 366

312 4,701,054
336 4,701,055

CLASS 367

25 4,701,890
31 4,701,891
35 4,701,892
87 4,701,893

CLASS 368

89 4,701,056

CLASS 369

13 4,701,894
4,701,895
32 4,701,896
4,701,897
4,701,898
36 4,701,899
4,701,900
75.2 4,701,901
77.1 4,701,902
216 4,701,903

CLASS 370

3 4,701,904
18 4,701,905
60 4,701,906
63 4,701,907
85 4,701,908
4,701,909
4,701,910
4,701,911
94 4,701,912
110.1 4,701,913

CLASS 371

13 4,701,914
4,701,915
15 4,701,916
16 4,701,917
20 4,701,918
21 4,701,919
25 4,701,920
4,701,921
4,701,922
41 4,701,923

CLASS 372

19 4,701,924
38 4,701,925
45 4,701,926
46 4,701,927
68 4,701,928
71 4,701,929
96 4,701,930

CLASS 373

72 4,701,931
104 4,701,932
117 4,701,933

CLASS 375

1 4,701,934
4 4,701,935
14 4,701,936
25 4,701,937
36 4,701,938
115 4,701,939

CLASS 376

172 4,701,296
260 4,701,297
273 4,701,298
302 4,701,299

CLASS 378

34 4,701,940
122 4,701,941
156 4,701,942

CLASS 379

57 4,701,943
63 4,701,944
66 4,701,945
98 4,701,946
124 4,701,947
165 4,701,948
179 4,701,949
214 4,701,950

CLASS 381

24 4,701,951
25 4,701,952
46 4,701,953
49 4,701,954
51 4,701,955
61 4,701,956
68 4,701,957
4,701,958

CLASS 382

1 4,701,959
3 4,701,960
34 4,701,961

CLASS 384

45 4,701,057
4,701,058
49 4,701,059
106 4,701,060
484 4,701,061

CLASS 400

202.1 4,701,062
621 4,701,063

CLASS 403

71 4,701,064
263 4,701,065
298 4,701,066
326 4,701,067
359 4,701,068

CLASS 404

75 4,701,069
4,701,070
114 4,701,071

CLASS 405

53 4,701,072
133 4,701,073
169 4,701,074
217 4,701,075
224 4,701,076
232 4,701,077
238 4,701,078
296 4,701,079

CLASS 406

109 4,701,080

CLASS 408

1 R 4,701,081
127 4,701,082
240 4,701,083

CLASS 409

131 4,701,084
244 4,701,085

CLASS 410

26 4,701,086
94 4,701,087

CLASS 411

369 4,701,088
373 4,701,089

CLASS 413

13 4,701,090

CLASS 414

70 4,701,091
115 4,701,092
312 4,701,093
330 4,701,094
332 4,701,095
416 4,701,096
495 4,701,097
502 4,701,098
563 4,701,099
751 4,701,100
786 4,701,101

CLASS 415

136 4,701,102
219 C 4,701,103

CLASS 416

44 4,701,104
95 4,701,105
241 B 4,701,106

CLASS 417

86 4,701,107
104 4,701,108
223 4,701,109
269 4,701,110
300 4,701,111
345 4,701,112
472 4,701,113
564 4,701,114

CLASS 418

55 4,701,115

CLASS 419

21 4,701,301

CLASS 420

470 4,701,302

CLASS 422

41 4,701,303
62 4,701,304
73 4,701,305
101 4,701,306
147 4,701,307

CLASS 423

2 4,701,308
16 4,701,310
20 4,701,309
87 4,701,311
213.7 4,701,312
277 4,701,313
311 4,701,314
328 4,701,315
344 4,701,316
445 4,701,317

CLASS 424

52 4,701,318
4,701,319
54 4,701,320
60 4,701,321
70 4,701,322
88 4,701,323
118 4,701,324
164 4,701,325
408 4,701,326
455 4,701,327

CLASS 425

72 R 4,701,116
116 4,701,117
185 4,701,118
369 4,701,120
436 R 4,701,119
526 4,701,121
584 4,701,122

CLASS 426

2 4,701,328
74 4,701,329
270 4,701,330
302 4,701,331
4,701,332
432 4,701,333
510 4,701,334
511 4,701,340
533 4,701,335
538 4,701,336
548 4,701,337
602 4,701,338
643 4,701,339

CLASS 427

3 4,701,341
38 4,701,342
39 4,701,343
4,701,344
45.1 4,701,345
46 4,701,346
57 4,701,348
93 4,701,349
97 4,701,350
98 4,701,351
4,701,352
213 4,701,353
255.6 4,701,354
317 4,701,355
423 4,701,356
4,701,357

CLASS 428

35 4,701,358
4,701,359
4,701,360
36 4,701,361
131 4,701,362
137 4,701,363
141 4,701,364
171 4,701,365
188 4,701,366
216 4,701,367
233 4,701,368
313.9 4,701,369
314.4 4,701,370
323 4,701,371
4,701,372
326 4,701,373
336 4,701,374
4,701,375
358 4,701,376
364 4,701,377
414 4,701,378
427 4,701,379
447 4,701,380
457 4,701,382
527 4,701,383
548 4,701,381
688 4,701,384
693 4,701,385

CLASS 429

179 4,701,386

CLASS 430

5 4,701,391
45 4,701,387
57 4,701,392
4,701,393
4,701,394
58 4,701,395
4,701,396
110 4,701,389
138 4,701,397
179 4,701,399
196 4,701,300
209 4,701,388
233 4,701,400
257 4,701,401
325 4,701,390
332 4,701,402
510 4,701,398
529 4,701,403
559 4,701,404
567 4,701,405

CLASS 431

171 4,701,123
284 4,701,124

CLASS 432

1 4,701,125
58 4,701,126
242 4,701,127

CLASS 433

116 4,701,128
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DESIGN PATENTS

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27 : 292,401

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55 : 6,039

6,040

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